

## A.S.R.E. Members Renew Old Friendships at 'Fiesta' Staged by the News



The carnival spirit took hold of everybody at the News' "Refrigeration Fiesta" for A.S.R.E. members last week. (1) Two Fedders men—Joe Askin, chief engineer, and H. E. Rieckel—man drew a pair of the sixteen "Spanish Senoritas" (all selected from the News staff) who were costumed for the event. (2) "Senorita" Winifred Hughes of the editorial dept. falls for Joe's line of talk. (3) Lola Dew (back to camera) and Dorothy Ross, staff "Senoritas," wait for coffee and ice cream. (4) Betty Cole of the News caught the cameraman in the act—but Betty Knight and John Wyllie (Temprite) were taking their eating seriously.



(1 and 2) K. B. Thorndike and C. J. Swan, Detroit Lubricator, found the editor's office a good spot in which to engage in mutual pleasantries. (3) Ira Reindel and Herb Morley of Norge drink a toast to the autographed photo of their associate, John Knapp, on a wall of the editor's office. (4) Helen Pepper of the A.S.R.E. headquarters staff in a non-technical mood, with Jack Schaefer, the News' former engineering editor, who now directs York Ice Machinery Corp.'s publicity, an attentive and interested listener.



(1) Mr. Swan and the stunning Mrs. Ted Coggin listen to whomever is underneath the bald spot. (2) "Here's looking at you!" (3) E. T. Williams and George Bright, old timers in A.S.R.E. ranks, recall early days of the industry. (4) Glenn Muffly and Jack Schaefer renew an acquaintance begun when Jack was digging up engineering dope for the News.



(1) Chaz Chase, nationally famous comedian, who was a feature of the Fiesta's floor show, snatches a snooze in his improvised dressing room as he awaits his turn on the program. (2) Not bad, eh? Corine Muer's pianist, popular Harriet Denton. (3) Dorothy Berlin, winner of Kate Smith's national radio audition, serenades dinner-time Fiesta guests from the "balcony." (4 and 5) Lester Larkin (Larkin Coils) helps Miss Berlin with a chorus of "I Want a Girl Just Like the Girl Who Married Dear Old Dad."



(1) Samuel Bloom, A.S.R.E. vice president, finds conversation difficult amidst the music and hilarity. (2) R. I. Petrie (Kelvinator) and Mrs. Petrie drink a toast. (3) Mr. Petrie greeted many friends at the Fiesta. So did everybody—but engineering wasn't entirely forgotten. (4) Prof. Hugh Keeler (left) of the University of Michigan and chairman of the Detroit Section, A.S.R.E., discusses the reversed cycle or something.



(1) Prominent in promoting the social side of the whole A.S.R.E. meeting, was Elizabeth Bright, chairman of the women's entertainment committee. (2) "I'm more than pleased that so many women came." (3) "Light? Sure thing, Sis," says George Bright, Jr. Marguerite Bright, another daughter of the well-known George, Sr., and Mrs. Bright were also at the party.



## Cincinnati Code Governs Dealers In Refrigeration

**Prices, Discounts, Trade-Ins Are Regulated in New Fair-Practice Pact**

CINCINNATI—Retailers of household electric refrigerators in Metropolitan Cincinnati are now operating under a code of fair practices regulating prices, discounts, trade-ins, financing and advertising, reports Turner Barger of Bard & Barger, Inc., and president of the Refrigeration Division of the Cincinnati Electrical Association.

According to Mr. Barger, the code was agreed upon and subscribed to by all distributors and factory branches in Cincinnati, and thus became mandatory on all dealers.

While no penalties are indicated in the list of rules sent to dealers, it is generally understood that each distributor has warned his dealers of the consequences for the violation of the agreement.

The regulations which comprise the code are designed to safeguard the (Concluded on Page 5, Column 1)

## New Frigidaire Units Designed for Hotels

DAYTON—Four new low side air-conditioning units designed and produced after a survey of air conditioning needs in hotels, club quarters, and other similar applications, have been introduced by Frigidaire Corp.

These units provide practically all the advantages of the concealed duct systems for those places in which the use of duct work would not be practicable or desirable.

The new models are intended primarily for installation inside of closets, bath rooms or other small spaces adjoining the guest sleeping or living rooms. Here they may be placed at the right point overhead and out of the way of the curious guests.

Grilled openings to the room admit the conditioned air and return air is taken to the unit directly through other grilled openings in walls or through louvers or grilles in closet doors.

They may also be used in connection with short localized duct systems where ever necessary to make (Concluded on Page 8, Column 3)

## Kansas City Nighthawks Canvassed in All-Night 'Push' of G-E Jockeys

KANSAS CITY—Citizens staying up late, policemen on night beats, filling station attendants, farmers getting up to milk cows, and other persons here up and around in the wee small hours of the morning found themselves but-tooled early one Friday in May by men wearing jockey caps and carrying jockey whips, and who gave them the sales story on G-E refrigerators.

This rather strange procedure marked the culmination of an intensive sales drive by salesmen staging the "Over the Top for Don Keller" week for Don Keller, head of Midwest Electric Appliances, Inc., G-E distributor here, as part of G-E's national Refrigeration Sweepstakes contest.

The 24-hour never-quit finish fulfilled the pledges of the Midwest Electric Appliances department heads, final reports showing 264 refrigerators and 30 water coolers sold.

On the final day of the drive the Midwest salesmen, who had been working from early morning, were teamed up in fours and sent out into the night (fortified by a late lunch prepared by their wives) with instructions to ring the doorbell of any house that showed a light, and not to report until daybreak.

They wore jockey caps, carried jockey whips and were fortified with identification buttons so local police would not think they had escaped from an asylum.

These salesmen didn't stop when all the doorbells were rung. They canvassed all night lunch stands, filling station attendants on night duty, police stations, fire houses, and all other places where it looked like any one might be awake.

## RMA Urges Firms To Maintain NRA Code

NEW YORK CITY—Representatives of the executive committee of the Refrigerating Machinery Association, meeting May 31 here, telegraphed each member of the refrigerating machinery industry, urging them to maintain the provisions of the NRA code under which they had been operating.

Text of the telegraphic message, which went out over the signature of RMA President D. Norris Benedict, was as follows:

"With the elimination of the codes all American industry is distinctly on trial. After consultation with Messrs. Lyle, Shipley, and Baer members of our executive committee all strongly urge members of our industry to continue existing labor rates and relations as well as maintaining fair prices and fair trade practices as provided in our industry code to the end that unfair and unjust criticism of us as manufacturers may be obviated and demonstrate that industry can operate fairly and with the public weal in mind."

## New York Edison to 'Sell for Dealers'

NEW YORK CITY—A new cooperative plan, designed to increase dealers' sales of electrical appliances, by actual order taking on the part of the utilities, was launched last week by the New York Edison Co. and the United Electric Light & Power Co. Manufacturers, distributors, dealers, and the utility companies will participate in the campaign.

Since July 1, 1933, when they quit the practice of selling directly to customers, the utility companies have devoted their efforts largely to a program of sales promotion, which included the turning over of leads to dealers to complete the sales.

Under the new plan, the utilities will take orders, transmitting these to (Concluded on Page 2, Column 4)

## Servel Reports \$727,036 Profit for 6 Months

EVANSVILLE, Ind.—Servel, Inc. has reported a net profit of \$727,036 for the six months ended April 30, as against a net loss of \$177,935 for the same six months last year.

## NRA Out—What of It?

DETROIT—That the refrigeration industry is competent to manage its own affairs without regulation from bureaucratic Washington was the consensus of opinion among leading executives of the industry who answered the following wire:

"Do you believe NRA plan should be continued in some form, even if it is necessary to change the Constitution? Can industry solve its own problems or is government regulation needed? What effect will the recent Supreme Court decisions adverse to "New Deal" have on Refrigeration Industry?"

Several of those who replied made the point that the industry's high standard of wages and hours should be maintained, and expressed the hope that a cat-and-dog competitive situation would not develop. They all felt sure, however, that self-regulation would be much more effective and desirable than the attempts of political appointees unfamiliar with the problems of the business to run the industry.

A feeling of relief at the lifting of the government's heavy hand is coupled with a high spirit of confidence that the industry will maintain its present standards and improve its position. Obviously refrigeration executives do not share the desperate fears of the Administration that the country will go to the dogs if government is taken out of business.

The telegrams follow:

### EVANS Urges Maintenance of Present Standard

Philadelphia, Pa., June 3. The supplemental code governing the Refrigeration Industry under 1 hp. contained only a formula of fair trade practice agreed on unanimously by producers of substantially all of such equipment. Wage levels maintained before and since adoption of basic Nema code have been exceeded by manufacturers.

I believe that it is generally recognized in the industry that it will be to both common and several interests of members of industry to maintain present levels and that such rule will be pretty generally followed and fair trade agreements under codes adhered to voluntarily. Would advise the industry to await political developments and governmental proposals before a clear express of viewpoint or opinion can be generated.

I believe that this large manufacturing industry can be conservatively and profitably managed if each manufacturer resolves to maintain high standard in quality of product to sell at reasonable prices and compete fairly, honestly, and openly.

Our trade association, I hope, will with or without new NRA legislation or Constitutional change function effectively and harmoniously in the future as in the recent past for the welfare of the business as a whole. This, if I may add, is an extremely important consideration to be taken into account as refrigeration has a magnificent future awaiting it in its many lines of application if those in the industry are big enough to constructively advance the industry as a whole and operate it on high standards.

The field for expansion, if capably and fairly handled, will make this industry not only a fine one for those engaged in it but one which will add to the health and convenience of the nation.

THOMAS EVANS, President, Merchant & Evans Co. Chairman, Refrigeration Div. of Nema

### FINNIE Calls Attention to Industry Voluntary Compliance

Detroit, Mich., June 4. In my opinion the discontinuance of the NRA will not in any way affect competitive conditions in this industry. During the year that our code was operative, remarkably fine compliance with its provisions was secured by voluntary action of the members of the industry. The NRA was never once called upon to help administer the code so obviously abandonment of that organization will not affect us in any way.

HALDEMAN FINNIE, Manager, Nema Refrigeration Division.

### QUINN Calls for Better Regulation Of Competitive Practices

Atlantic City, N. J., June 4. Decision against NIRA welcomed by those who naturally feel relief from restraint and return to what is called the American way but it does not solve the underlying economic fact that unrestricted competition is destructive. The public interest must prevail and Government represents the public.

We have indeed passed the horse and buggy stage as Supreme Court will decide when question is fairly placed before it. Best suggestion made is for Federal incorporation of concerns engaged in instate business.

If NRA is abandoned entirely, there will be some wage and price cutting in Refrigeration Industry but not by the large representative companies. I believe that the short hours of work restrictions will be the first to weaken. Government will probably do something to hold gains in hours and wage provisions.

T. K. QUINN, Vice President, General Electric Co.

### OTIS Calls for Calm Thinking By Industry Leaders

Chicago, Ill., June 3. The situation created by recent Supreme Court decisions calls for calm thinking and conservative action on the part of American business men. There is little doubt but that American business has the ability and courage to carry on successfully under the new circumstances and responsibilities placed upon it. Refrigeration industry should not suffer under the new order provided leaders will maintain cooperative spirit and self restraint.

J. E. OTIS, Jr., President, Stewart-Warner Corp.

### CROSBLEY Believes Industry Will Continue Cooperation

Cincinnati, Ohio, June 4. I believe that the refrigeration manufacturers should and will continue to cooperate with each other on some plan that is mutually beneficial. I believe this industry has learned much from the NRA, and that it should now be able to continue the good work that has been started without government regulation.

POWELL CROSBLEY, Jr., President, Crosley Radio Corp. (More Opinions on Page 6)

## Shipments Hit Peak in April; Inventories Big

**Industry Sells 741,700 Units in 4 Months; 281,900 in April**

DETROIT—Household electric refrigerator sales set a new all time mark in April when manufacturers shipped an estimated 281,900 units to distributors and dealers throughout the world. This April figure represents the highest mark which sales have ever reached in any one month, and tops last year's April figure by better than 10 per cent.

During the first four months of 1935, industry manufacturers sold 741,700 household electric refrigerators in comparison with 524,900 in the same period of 1934. This year's cumulative figure shows a gain of 41 per cent over that recorded for the first four months of last year, and represents 53 per cent of the 1,390,000 refrigerators sold during the entire year 1934.

Preliminary export figures, as compiled by the U. S. Department of Commerce, totaled approximately 25,100 refrigerators during the first quarter of the current year. April export figures have not as yet been released by the Government. With the deduction of exports from the first quarter world sales figure of 459,800 units, it is indicated that about 434,700 house- (Concluded on Page 12, Column 3)

## G-E Holds Premiere Of Promotion Movie

CLEVELAND—With an audience that packed the downtown Hanna Theater, the premiere of "Three Women," a technicolor movie, was staged here last week under the sponsorship of Electrical Housekeeping, Inc., local General Electric appliance distributor.

The movie, just produced in Hollywood, with an all-star cast headed by Johnny Mack Brown, was sponsored by the specialty appliance department of General Electric Co. It deals entertainingly with electric kitchen appliances. The action is woven around an interesting human interest and love lot.

The movie now is available for showing throughout the country, through General Electric home appliance distributors. It will be shown in neighborhood movie houses, at cooking schools, in utility and department store auditoriums, and in vari- (Concluded on Page 8, Column 1)

## 8,151 Units Is 4 Months Total in Cincinnati

CINCINNATI—A total of 8,151 household electric refrigerators were sold in the Cincinnati retail area during the first four months of 1935, reports Turner Barger of Bard & Berger, Inc., president of the Refrigeration Division of the Cincinnati Electrical Association.

This compares with a total of 7,136 refrigerators sold during the same period in 1934.

The Cincinnati retail area comprises Hamilton County, Ohio; and Kenton and Campbell counties in Kentucky.

At this rate, Mr. Barger believes, the 1935 quota of 25,000 units for the Cincinnati area will be realized.

## Crosley to Pay 25 Cent Dividend July 1

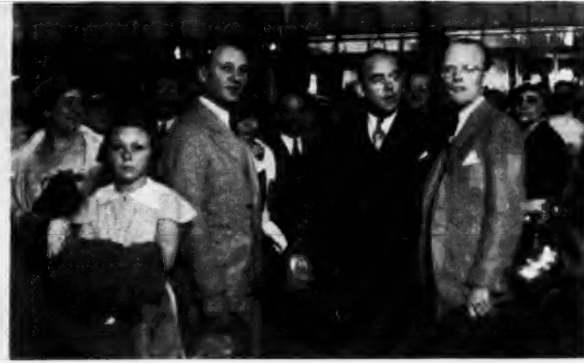
CINCINNATI—Crosley Radio Corp. at the annual meeting May 28 declared a dividend of 25 cents, payable July 1 to stockholders of record June 15.

Payment of a dividend at this time does not establish a regular program for the stock, Powell Crosley, Jr., president, said. He stated that it would be the policy of the company to pay dividends in the future in as great amounts as possible without jeopardizing the future of the company.

It will be the aim of the directors, Mr. Crosley said, to keep the company liquid at all times, and to use the surplus cash for purposes of expansion and of diversification of the (Concluded on Page 2, Column 5)



## G-E Executives Join Throng to See Movie Dramatization of G-E All-Electric Kitchen



"Three Women," General Electric's technicolor movie of the electric kitchen, played to a capacity crowd in its world premiere at the Hanna Theater in Cleveland last week, prior to nation-wide showing through G-E distributors. (1) Thelma Kelly and Mae Clouser of the G-E sales promotion department chat with friends in the lobby before the movie starts. (2) A. L. Sweeney, manager of the sales division, Mrs. X. F. Sutton, A. L. Scaife, sales promotion and advertising manager, Mrs. Paul Dow, Mrs. Sweeney, and Bill Henze, under the "Hollywood Lights." (3) Sam Nides of R. Cooper, Jr., Chicago G-E distributor, R. C. Cameron, and Art Scaife agree that the show should go over big in Chicago. (4) Fred Harvey (extreme right), central district manager.



(1) Laura Thompson, G-E phone girl, and Bob Watts of the sales promotion department had to get to the theater ahead of the crowd. Bob was a ticket taker. (2) X. F. Sutton, Mrs. Sutton, P. B. Zimmerman, manager of the specialty appliance sales department, and Mrs. Zimmerman. "Zim" explained the "New American" home building program to those at the premiere. (3) A section of the crowded theater lobby, just before the "Standing Room Only" sign went up. (4) H. H. Bosworth, central station manager, and Mrs. Bosworth.

### G-E Holds Premiere Of Promotion Picture

(Concluded from Page 1, Column 5)  
ous other ways. It is expected that 15,000,000 people will see the picture.

The premiere had all the earmarks of a Hollywood first night, with fully one-fourth of the audience in evening dress. "Hollywood lights," or huge sun arcs, were stationed across the street and were played on the theater as crowds arrived. Ushers—junior executives of the specialty appliance department—were in evening attire.

In connection with the premiere, the

local activity on the "New American" home building program was launched. Previous to the showing of the picture, P. B. Zimmerman, manager of the specialty appliance department, explained the "New American" plan, while Frank Connolly, of the Federal Housing Administration, Washington, D. C., discussed the FHA activities.

In the "Colonial room" of the theater—used ordinarily as a lounge or tea room—the house plans which won prizes in General Electric's recent nation-wide architectural competition were displayed. Thirty minutes after the show had closed, this room was still crowded with people interested in inspecting the house drawings.

To the premiere were invited archi-

itects, builders, bankers, realtors, homemakers, prospects, civic leaders, and others interested in home modernization and new home construction.

Four reels in all, G-E's new movie has two reels in technicolor. As a commercial technicolor picture, it has beat "Becky Sharp," feature technicolor movie, to the public.

"Three Women" tells a complete story of the electric kitchen and stresses the importance of the dishwasher and range, as well as the refrigerator. The health angle of the dishwasher is played up, while the ease of electric cookery is emphasized. But its commercial aspects are not objectionable. The movie primarily is entertainment.

In the cast are such people as Johnny Mack Brown, Hedda Hopper, William Collier, Sr., Inez Courtney, Bert Roach, Addie McPhail, Sheila Mannors, Dickie Jones, T. Roy Barnes, Roy D'Arcy, Vera Steadman, Neal Barns and the Kibrick boys.

Continuity for the movie was written by A. L. Scaife, sales promotion manager of G-E's specialty appliance department, and Pat Brigham of Sound Pictures, Inc. Scaife with X. F. Sutton, president of Sound Pictures, went to Hollywood to produce it.

Monte Brice, one of the best known of west coast directors, directed the picture. The scenario was adapted by Paul Schofield, who leaves soon for India to work on "Untouchables." Camera work by Jerry Ash on the black and white, and by William Skall on the technicolor. Mrs. Natalie Kalimus, national known authority on technicolor, was in charge of this part of the picture. Others on the staff included Ruth Inwood on dialogue, Mac D'Agastine, art director.

In discussing the "New American" home plan before the showing of the film, Mr. Zimmerman predicted that the new style of houses would strike the public fancy. He said that the "New American" style was a distinct advance in home plans; that due to insulation and air conditioning the old style roof no longer was necessary; that homes would be built from the inside out, with consideration for livability and convenience. The "New American" homes, he continued, can be built and equipped with all modern labor-saving appliances for a price as low as the old style homes without such equipment.

General Electric, he said, would cooperate with builders, giving builders of these demonstration homes equipment at a substantial discount and helping to advertise and promote the homes, as well as making the prize winning plans available to them. Work on the homes is starting in many places in the country, and it is expected that from 2,000 to 5,000 such homes will be built and ready for opening by Sept. 1.

### N. Y. Edison Makes 'Sales for Dealers'

(Concluded from Page 1, Column 2)  
approved local dealers for filling.

The companies will not accept any part of the purchase price of the appliances sold, and all financial transactions, whether on cash or deferred-payment sales, will be handled by the dealer who fills the order.

The plan will be restricted to appliance dealers of high standing, and will be limited to the sale of appliances that have been tested and approved by the utility companies, according to E. F. Jeffe, assistant vice president in charge of sales of two companies.

One of the required qualifications of dealers is membership in the Electrical Association of New York. Recent filing of reductions in electric rates should prove of material assistance in the campaign, Mr. Jeffe pointed out.

Except in special instances, all orders will be taken on appliances listed for less than \$25 on a C. O. D. basis. Deferred-payment plans will be effective on appliances selling for more than \$25, and, from time to time, on appliances in special campaigns, such as refrigerators, electric fans, and the like.

Deferred payment plans for the sale of electric refrigerators and electric fans have already been worked out.

Orders taken in various New York Edison Co. showrooms will be turned over to manufacturers whose products the customer has selected. Manufacturers will in turn distribute the orders to dealers located nearest the customer's residence. Plans for the dissemination of leads as well as for actual orders will be placed in effect within a short time.

### 25-Cent Dividend Is Declared by Crosley

(Concluded from Page 1, Column 5)  
company's business. He said there were several other fields that showed promise and that inasmuch as the company's present profitable operations were due largely to diversity, a continuation of that policy was not only logical but probable.

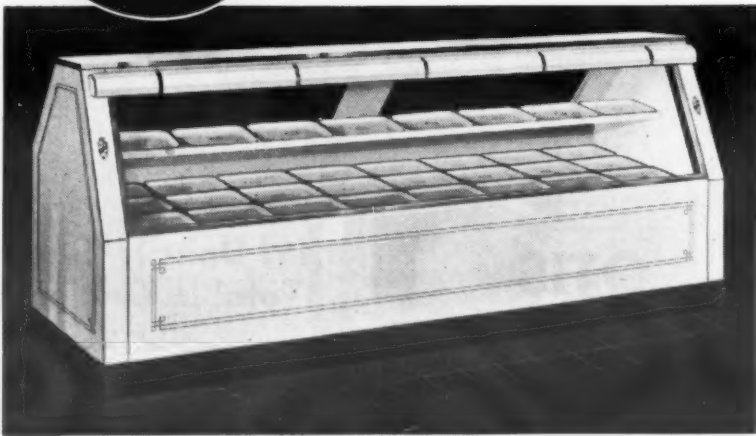
J. P. Rogers, assistant general manager, was elected a director to succeed J. D. Cloud, at the meeting of stockholders. Because Cloud's firm is accountant for the company, Cloud resigned to avert the possibility that the Securities and Exchange Commission might question his serving as director as well as accountant, it was explained. All other officers and directors were re-elected.

At the organization of the board, Rogers was elected a vice president of the company, a new office. Lewis M. Crosley and Charles Sawyer are also vice presidents, Mr. Crosley being also general manager of the company.

Tracing the growth of the company's electric refrigerator business, Mr. Crosley said that in the year ended March 31, 1935, the company made and sold 132,000 refrigerators as compared with 65,000 the preceding year, and as compared with 15,000 in the first year the company was in the field. Operations so far this year have been running ahead of last he stated.

Broadcasting divisions, always profitable during the last several years, are showing increasing profits, Mr. Crosley declared. The radio business is good now and the prospect is the best in several years, he said, pointing out that the company is making radios for several leading automobile manufacturers and is likely to increase its share of the motor radio business in the near future.

Speaking of wages, Mr. Crosley said women plant employees are paid at least 33 cents an hour, as compared with code minimum pay of 30 cents, and they average 46 cents an hour. Men plant workers average 59 cents an hour; lowest pay is 41 cents compared with code minimum of 40 cents, he said.



1935-36 Models of H. & H.

### ALL COLD DISPLAY CASES

Greater Convenience

More Display Room

Speed-Up Service!

The H. & H. ALL COLD CASE contains CERTAIN EXCLUSIVE FEATURES that insure perfect refrigeration.

"Natural" circulation of air eliminates loss from discoloration, trimmings and spoilage.

Ultra-modern refinements have made this famous ALL COLD line, long an acknowledged leader, now even more outstanding in the commercial refrigeration field.

We have a genuine money-making proposition to offer distributors and dealers in protected territory.

**HOLCOMB & HOKE MFG. CO.**  
INDIANAPOLIS INDIANA

### ATTENTION REFRIGERATION DEALERS

One glance at the "ONE DRAW BEER COIL" Immediately convinces you, that here is the beer cooler you have always wanted. It has everything.

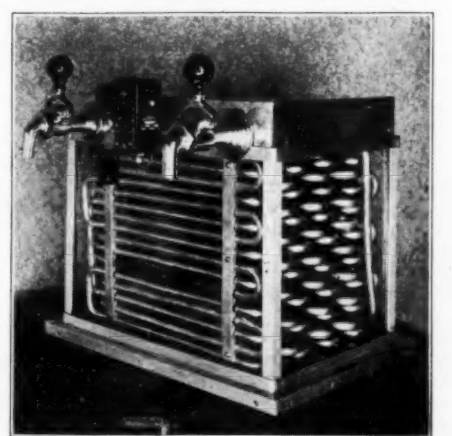
Sweeps away competition in the selling field having advantages that no other beer cooler has.

Extremely safe for both, customer and dealer. Reduces service calls to minimum. No interruption of business, even when service is required. Can be used with ice, in case of mechanical trouble.

Tremendous hold over capacity, with hours of continuous draw. Customer operated positive temperature control. It can be installed in any old dispensing unit. It controls beer under high, or low pressure, operating on 10-15 or 30 lbs., on barrel. All beer coils are genuine block tin, and, the price is right.

Write or wire for descriptive literature.

**ONE DRAW BEER COIL COMPANY**  
435 Collinsville Ave. East St. Louis, Ill.







# THREE WOMEN

## WILL HELP YOU SELL GENERAL ELECTRIC REFRIGERATORS



### Another Scoop by General Electric!

**Sensational New Full-Length Sound Movie With Technicolor Puts  
Famous Hollywood Stars on the Sales Staff of Every G-E Dealer!**

**N**ews from General Electric and Hollywood! The brilliant new G-E feature picture "Three Women", with leading Hollywood players, is now ready to spread its sensational General Electric sales message across America. 40 minutes of 5-star entertainment, featuring the General Electric refrigerator and other G-E kitchen appliances! Technicolor reproduction that has made movie history in Hollywood! Glamorous stars! A skillfully woven plot that holds you spellbound from start to finish! And as many expressed it at the premiere showing in Cleveland before a packed audience: "better than a score of ordinary movies!"

Here's sales appeal that will get right down under the skin of Mrs. Housewife. It will inoculate her with the G-E Kitchen

germ that won't give up until she modernizes her kitchen with a G-E refrigerator, G-E range and G-E dishwasher.

This movie will soon be shown to the women of your community. After that, watch the parade to the General Electric dealer's store! If you want it to head YOUR way, see the General Electric refrigerator distributor or write or wire direct for details. General Electric Company, Specialty Appliance Department, Section DF61, Nela Park, Cleveland, Ohio.

*This is the Age of Electrical Living and only GENERAL ELECTRIC makes a complete line of electrical appliances for the home. The General Electric refrigerator franchise has the PLUS values that mean permanent profits for the dealer.*

**GENERAL  ELECTRIC**

### All-Star Cast!

JOHNNY MACK BROWN  
SHEILA MANNORS  
WM. COLLIER, SR.  
HEDDA HOPPER  
BERT ROACH  
ROY D'ARCY  
VERA STEADMAN  
INEZ COURTNEY  
ADDIE McPHAIL  
T. ROY BARNES  
DICKIE JONES

Director: MONTE BRICE  
(of "Moonlight and Pretzels" and  
"Take a Chance" fame)



## PERSONALITIES

By George F. Taubeneck

### A.S.R.E. Golf Tourney

Somehow the report of the golf tournament held in conjunction with the A.S.R.E. spring meeting in Detroit got lost in the shuffle of last week's big issue of the News. And there was real news therein. Read the list of winners:

GEORGE LANG of the American Ice Co. copped first prize, the Kelvinator Cup. Second prize, a set of wooden clubs donated by ROBERT QUINN of the Mathieson Alkali Co., was won by E. T. WILLIAMS, consulting engineer of New York.

The third prize, a duffle bag presented by IRV KNUDSON of Detroit Lubricator, was won by OTTO KLOPSCH, Wolverine Tube. The fourth prize, a dozen golf balls donated by EMMETT MUELLER of Mueller Mfg. Co., went to CORDLEY HALL, Johns-Manville Co.

Gentlemen, for those of you who came in late we'd like to remark that E. T. WILLIAMS, who won the highly practical second prize (a set of woods), is one of the oldest men in the electric refrigeration industry—from both standpoint of personal age and years in the industry.

He produced one of the first practical household electric refrigerators 'way back in the year 1912, and ever since that time his snowy-white locks have been in the thickest of the industry's strife.

Who said this is a young man's world?

### Quick Freezing

That the poultry field offers the greatest opportunity for quick-freezing methods because the product is delicate and easily affected by bacterial action was pointed out by M. T. ZAROTSCHENZEFF, technical director of the American Z Corp., in an informal interview with the editor while Mr. Zarotschenzeff was attending the convention of the American Society of Refrigerating Engineers here.

Studies of specialists from the United States Department of Agriculture about two years ago showed that quick frozen poultry, after six months' cold storage had much less bacteria than the poultry frozen in ordinary cold storage, Mr. Zarotschenzeff said. Fat acidity, which governs rancidity, is also checked by quick freezing.

Mr. Zarotschenzeff (we're almost as proud of our ability to spell this name without looking it up as we are of our hard-won facility in rattling off correctly the 23 consecutive letters of dichlorodifluoromethane) has long been one of the important figures in the pioneering of quick freezing, and is a much-respected, venerated patriarch around meetings of the American Society of Refrigerating Engineers.

His reply to one rather pointed question—about the high cost of quick freezing—was indeed interesting.

"That quick freezing is expensive," he stated with no little vigor, "is a common fallacy which dates back to 1928, when quick freezing was given an untimely boom. Now quick freezing has got down to earth, and can make its own living on its merits."

"These demonstrations," he continued, "have shown the following encouraging results: elimination of freezer burn, elimination of shrinkage, and quick-freezing of hams in less than six hours as compared with the 48 hours formerly necessary."

In the fruit and vegetable fields Mr. Zarotschenzeff believes that quick freezing will become just as important as canning, and that quick-frozen fruits and vegetables may be offered to the consumer at competitive low prices in the very near future.

England, he stated, is becoming an exceptionally good market for quick-frozen foods. A quick-freezing plant for fresh fillets in packages at Grims-

by, England, has recently doubled its capacity of 12,000 lbs. of quick-frozen fish fillets per day to 24,000 lbs.

The "Z" Frozen Food Products Co. has been organized in Bombay. The process is also being used in South America and Finland, according to Mr. Zarotschenzeff.

### More Greenfield Village

(This is a continuation of a description of a trip taken through Henry Ford's reconstruction of American history, Greenfield Village, by R.S.R.E. members.)

Most delightful character in Greenfield Village is the Beethoven-haired old proprietor of the small tintype studio, where many famous people have been photographed, and where guests may have tintypes made for payment of a small fee. His studio is constructed with a skylight on one side of the roof and windows on one wall. You could take pictures with a Brownie in there, so much light enters.

Sliding white linen curtains that can be drawn to admit the right degree of light cover the windows. Here also may be seen an original daguerrotype camera, and other antiquated photographic equipment, as well as a library of exceedingly rare old books on photography.

The "fotographer" himself delights in showing you his album of tintypes, and will talk for hours—unless you are skilful at breaking away—about the detailed personal and family history (who married whom and about when but not why) of each of his subjects. He talks in the same uncertain let-me-see yes-it-was no-it-wasn't style employed by Graham McNamee in broadcasting a sporting event.

### Sees the Sights



A. H. Eustis, president of Virginia Smelting Co., looks at the village blacksmith shop in Greenfield Village.

Those who retain a school day remembrance of John Greenleaf Whittier's poetry like the Toll House Shoe Shop, mentioned in Whittier's "The Countess."

This little shop, built in 1828, at East Haverhill, Mass., housed a toll keeper who made shoes in his spare time. Adding local color to the shop are the toll list, swinging lamps, fiddle, fire bucket, musket, and a sign from an old bridge.

Plymouth House, with its double-story side, slanting down to a low, one-storied room, and its four sturdy white porch pillars, gives sightseers a picture of many a small town and country house of the past century. Peter Trinkaus erected this house in 1845 in the town of Plymouth, Mich.

For those who like their old-fashioned architecture linked with little anecdotes of the famous, Smith's Creek Depot is a bill-filler. It was at this depot that Thomas A. Edison, then a boy of 15, was ejected for

setting fire to a payload while experimenting with chemicals in the baggage car, where he was employed as news agent.

The depot was built by Findlay McDonald and his brother in 1858. It was located not far from Port Huron on the Detroit-Port Huron run.

Representative of one of the earliest small machinery-using shoe shops is the Currier Shoe Shop which was brought here from Newton, N. H.

### The Village Smithy

The village blacksmith shop is a rambling, long stone building on the corner of Washington and Maine Streets, in the village. It does not stand under a spreading chestnut tree.

A forge, hand bellows, and other necessary tools are installed in the shop, where the horses which draw the village carriages are shod.

If you like horses you'll be able to abide the smell. Otherwise you probably won't hang around the village smithy long.

Sir John Bennett's jewelry shop, which for many years was a landmark in Cheapside, London, has been reconstructed into a two story building to house a remarkable clock.

Four effigies on this clock—Gog and Magog, an angel, and Father Time, strike notes on the hour, the quarter, the half, or three-quarters of the hour. Beautiful examples of the jeweler's art, and pioneer methods of watch and clock-making are exhibited in this structure.

Memorial to the pioneering copper-smith is the Kingston Copper shop, brought from Kingston, N. H. Equipping from Kingston, N. H.

Equipped with crude hand tools and utensils of the coppersmith, this small shop dates back to about 1785.

Students may be seen weaving cloth in the old Carding Mill, which originally stood near Plymouth, Mich., where it was erected half a century ago. In the olden days farmers from miles away brought their wool to this establishment to be carded.

From Newton, N. H., the village fire house was brought. The Rock's Village engine, built in 1845, is also from New Hampshire.

Unique, in that it was the first power silk mill in the United States, is the small frame building brought from Hank's Hill, Mansfield, Conn., where it was built in 1810. The mill was operated by water power. Today you just look at it, there being no mill-stream in Greenfield Village.

Gaily decorated spinning wheels from Bombay and a hand loom which is dated 1727 and which came from Holland, are among the eye-catching exhibits in the textile display. Practically all types of equipment used in making cloth are on exhibit there, however, and if that sort of thing interests you, you'll spend plenty of time studying the display.

### Agricultural Exhibit

Various steps in the growth of a season's crop may be traced in the agricultural display. Phases shown include the preparation of the soil for use, the planting of the seed, its cultivation, harvesting, and the actual preparation of the crop for use.

Mr. Ford, you know, has as his great dream the linking of industry with agriculture, and has conducted many experiments—particularly with the lowly soya bean—toward the end of devising new industrial uses for farm products.

In the early American craft shops much of the equipment is original, and the arrangement of each shop is minutely faithful to the period to which it belongs.

Included in these reconstructed shops is the Gun and Locksmith shop, which contains articles used by Locksmith John Brown of Haverhill, Mass. Antiquated fire arms, and the lathes and machines used in their manufacture, are displayed therein.

Women guests find the barber shop, characteristic of those used in 1875, a sharp and even abominable contrast with the modernly equipped, bright and sanitary beauty parlors of today.

## 'Over the Bridge'



During their visit to Greenfield Village and Dearborn, A.S.R.E. members saw this group of workmen leaving their jobs after a day in the Ford Motor Co.'s mammoth River Rouge plant.

But men—especially old gentlemen—love it.

Authentic in each detail, the shop contains individual shaving mugs, an arrowback barber chair, a coal stove with copper water heater, a hand pump and sink, dust covered tonic bottles, and a stuffed owl. All it lacks is a Police Gazette, and a sour quartette rendition of "Down by the Old Mill Stream."

### If Mr. Ford Needs Another Drug Store - - -

An apothecary shop, with its window bottles of colored water, show cases filled with patent medicines, and brightly colored perfume jugs, is representative of the Corner Drug Stores where men gathered to discuss campaign speeches and baseball batting averages in the not-so-distant past.

If this one ever burns down, or collapses like the one-hoss shay, we suggest that Mr. Ford get in touch with us. The writer's father owns a drug

### Draws Big Turnout



John Wyllie, Tempprite's sales manager and secretary of the Detroit A.S.R.E. section, in one of the Village's coaches, watches engineers loading into another.

store in Marshall, Ill., which hasn't been overhauled since Dewey sunk the Spanish fleet in Manila Bay. It would make a first-class replacement.

Other units representing early American crafts are the Boot and Shoe Shop, whose show-window gleams with copper-toed, red-topped boots; the Carpenter shop, containing a 17th century frame saw, old wooden hammers, planes, and similar tools; and the Hardware store, with its array of odd door knobs, latches, and knockers.

Visitors are next shown the Pottery works, reconstructed from a shop which stood in Exeter, N. H., in 1817. Two of the original kick-wheels, a lead mill, and several hand-made pots are displayed on the shelves.

The historic Caleb Taft blacksmith shop from Uxbridge, Mass., contains one of the few remaining slings in which an ox was fastened so that it could be shod. The poet Longfellow is said to have visited this shop many

times in its original locale. Nail-making benches, a stoneweight hand-operated drill, and a wooden frame forge are also present.

Advancing along the museum hall, visitors are shown the Pewter shop (with a melting caldron and a foot-power burnishing lathe) and the Tinsmith shop, both containing the equipment and articles used by the craftsmen of early days. This latter contains tools to turn out almost any conceivable small tinware article.

In the Candle shop, two of the most common methods of making candles, the dip and the mold, are on demonstration. Candle molds and several tallow caldrons are to be seen.

Next among the exhibitions of early American industrial plants is the Sandwich Glass Plant, named for the famous American pressed glass factory of the 19th Century on Cape Cod, Mass. Bricks from the original plant are used around the doors and windows of the replica.

Bringing visitors back to a contemplation of Michigan's own industrial story the reconstructed Lapeer Foundry, erected in Lapeer, Mich., about 1860 to supply the needs of pioneer sawmills and lumbering works, demands attention. Originally the plant was called the Lapeer Steam Engine Works, and was owned by William McDonald.

Equipped with lantern type roof and center crane for assembly work, the Armington & Sims Machine shop is a typical steam engine manufacturing plant of the eighties. Engines designed at this shop were used by Mr. Edison in his incandescent lighting systems 50 years ago.

### Ford's First Plant

No visit to Greenfield Village would be complete, of course, unless the small brick shed where Henry Ford built his first automobile were seen. This shed was located behind a house at 58 Bagley St., Detroit, where Henry Ford lived in the days when he was employed by the Detroit Edison Co., as mechanical engineer. The shed was restored to its original condition after being removed to the Village.

More monuments of early Michigan industry:

The Loranger Grist Mill, originally located about five miles north of Monroe, Mich. It was erected in 1832 by E. Loranger, a French Canadian from Three Rivers, Que. Sections of the machinery used in those days are installed in the mill at the present.

Two other old saw mills are interesting to those who would study the development of methods used in lumbering. One of these dates back 90 years. Adjoining this is the Tripp sawmill, where a vertical instead of circular saw is used. This mill stood at Tipton, Mich., and was one of the first in that region.

A modern note among all these relics is struck by the Research Laboratory, which houses apparatus used by Greenfield Village students in their experiments with agricultural chemistry. It's more than possible that this laboratory for by-products distillation some day will make history itself.

## Harvey Lindsay Draws a Picture of Moisture Absorption in Refrigerator Cabinets



Harvey Lindsay, president of Dry-Zero Corp., discusses insulation problems in the editor's office. (1) "Moisture between the cabinet walls is a big cause of higher operating costs in refrigerators." (2) "Our tests show that most insulation in boxes two or three years old is water-logged. Even in Dry-Zero insulated units, we've found free water inside the walls. (3) "Naturally, this cuts down efficiency. That's why most old units cost more to run." (4) "If manufacturers will turn their attention toward a moisture-proof cabinet . . ."



## Cincinnati Dealers Adopt Code Of Fair Practices

(Concluded from Page 1, Column 1)  
profits of the dealers and their salesmen and to eliminate the "racket" from the refrigerator business, declares Mr. Barger.

The agreement reads as follows:

### Article 1

#### Purpose

The Refrigeration Division of the Cincinnati Electrical Association suggests the following fair trade practices to the mechanical refrigeration Dealer organizations in greater Cincinnati, to eliminate some of the evils now existing, which tend to bring about a condition in the industry which is unethical and unfair to competition and harmful to both the dealer organization and the consumer.

No provision in these suggestions shall be interpreted or applied in such manner as to promote monopolies, or monopolistic practices, permit or encourage unfair competition or eliminate or discriminate against small enterprises.

### Article 2

#### Definitions

The word "Dealer" includes, but without limitation, any individual, partnership, association, trust or corporation engaged in whole or in part in the business of selling household mechanical refrigeration at retail.

The term "Household" signifies any mechanical refrigeration product sold for use in a home and any mechanical refrigeration product, irrespective of where sold by the dealer or used by the consumer, which is commonly classed by the industry as "Household" or "Domestic" excepting quantity sales for use in apartment houses and other similar quantity sales commonly classed as "quantity" or "wholesale" business by the industry.

### Article 3

#### Fair Trade Practices

##### Rule 1—Retail Selling Price:

It is suggested that the retail selling price of a new household mechanical refrigerator shall be the installed price recommended by the manufacturer or distributor, plus:

(a) Average cost of transportation to various points of dealer's territory if not included in the recommended installed price.

(b) State sales tax, as required by law.

(c) Any installation labor and/or material not included in the recommended installed price, such as electric wiring, remote installation of compressor, etc., at not less than cost including overhead.

##### Rule 2—Exceptions:

It is suggested that the following exceptions shall apply to the above prices:

(a) Sales to members of dealers' organizations when for the personal use of such buyer.

(b) Sales to a legitimate builder of homes where discount of not to exceed ten (10%) per cent of the installed price is to be allowed. (The dealer shall make every effort possible to prevent the builder from passing the discount to the ultimate consumer.)

(c) Sales to public, religious, and charitable institutions, for use in such institutions, a discount of not to exceed ten (10%) per cent of the installed price, is to be allowed.

##### Rule 3—Discontinued Models:

It is suggested that in the sale of bonafide discontinued models, the dealer is to be governed by the recommendations of the manufacturer and/or distributor.

##### Rule 4—Ice Box Allowance:

A dealer or his representative shall not make or advertise any allowance whatsoever, either directly or indirectly, on an ice box.

##### Rule 5—Trade-In Allowance:

A dealer or his representative shall not allow more for a used mechanical refrigerator than the amount shown on the schedule of allowances given by the distributor handling such make. In the event that a distributor of a certain make has no definite schedule of allowances, an amount not to exceed twenty (20%) per cent of the installed price of the product sold shall be allowed.

##### Rule 6—Financing:

Charges for financing retail conditional sales shall be upon an equitable basis to consumer and dealer. No cash discount is to be given.

##### Rule 7—Prospective Purchaser Tips:

A dealer or his representative shall not offer or give more than two (2%) per cent of the nationally advertised price, and not to exceed Five (5.00) Dollars on any one sale to an individual supplying the name of a person that may become a purchaser. This is to be paid in cash or merchandise to the party supplying the name of the buyer, and not to the buyers themselves.

##### Rule 8—Inaccurate Advertising:

(a) A dealer shall not use, or cause

to be used, advertising, whether printed, radio, display, or of any other nature, which is inaccurate in any material particular or misrepresents merchandise (including its use, grade, origin, material, content, or preparation (or credit terms, values, policies, or services); and shall not use or cause to be used, advertising and/or selling methods which tend to deceive or mislead the customer.

(b) No dealer shall advertise or promote selling activities offering products which are not intended to be openly and freely sold, with the object of attracting customers for the purpose of selling other products. No "free goods" shall be advertised or given away by the dealer at any time. Only standard equipment furnished by the manufacturer shall be included.

##### Rule 9—Breach of Existing Contract:

A dealer or his representative shall refrain from including or attempting

to induce breach of consumers' contracts. This shall apply even though the refrigerator itself has not been delivered.

##### Rule 10—Warranty and Service Policy:

The dealer shall be governed by and adhere to the policies established by the manufacturers pertaining to warranty and service.

## 'Interlaced Coil' Is Used in Beer Cooler

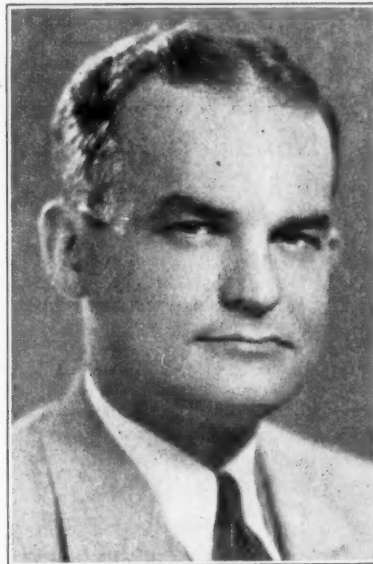
EAST ST. LOUIS, Ill.—An "interlaced coil" to insure even temperature throughout the tank features the "one draw beer coil" introduced by the One Draw Beer Coil Co.

This new beer cooler is constructed with 100 ft. of beer coil (50 ft. for each faucet) and 25 ft. of water coil. All coils are continuous and interlaced in such a manner that the beer coil is within 1/4 in. of the refrigeration coil, from end to end.

The coil is contained in a tank, measuring 10x16x18 in., holding approximately 11 gal. of brine.

The cooler is equipped with a thermostatic control, which can be regulated by the user.

### Sales Manager



R. W. BOULDIN  
General sales manager of Holcomb & Hoke Mfg. Co.

### Bouldin Is Appointed Holcomb & Hoke Sales Manager

INDIANAPOLIS — R. W. Bouldin, former commercial sales manager for Frigidaire in the north central region, has joined Holcomb & Hoke Mfg. Co. here as general sales manager.

Starting with Frigidaire Corp. shortly after his graduation from V. M. I. college of engineering in 1927, Mr. Bouldin has served as salesman, commercial supervisor, refrigeration engineer, general sales manager, and regional commercial manager in various Frigidaire branches.

In his new position, Mr. Bouldin will undertake expansion of the Holcomb & Hoke sales organization, including appointment of distributors and dealers to handle the company's line of "All Cold" refrigerator display cases and the H. & H. FireTender, automatic coal stoker.

Holcomb & Hoke has been conducting monthly sales contests among members of its All Cold refrigerator sales division. In a contest recently closed, automobiles were awarded to salesmen who made their quota.



## A GOOD SHOW and "FREON" AIR-CONDITIONED COMFORT

CAPACITY CROWDS reward the owner of the air-conditioned theater. During the hot summer months, the air-cooled theater offers relief from stifling discomfort. Cooling comfort is a show-house attraction even without a first-rate show.

Have you made a survey of the theater owners in the territory you serve? They are among your finest air-conditioning prospects. They know that people seek the theater offer-

ing cool, refreshing air. They know that a good show and air-conditioned comfort are twin attractions with an irresistible box-office appeal.

You can hasten many a wavering decision to air-condition by pointing out that the finest pictures play to half-empty houses when theaters do not offer cool, inviting comfort during the summer months; that summer attendance is tremendously increased after "Freon" air-conditioning is installed; that

smaller houses which have installed cooling systems have gained in prestige at the expense of the larger theater which has ignored public insistence for cool air.

The refrigerant almost exclusively used in air-conditioned systems in theaters and other buildings is "Freon." Emphasize "Freon's" safety features. It is non-toxic, non-flammable and odorless when mixed with air, and cannot cause a panic—the chief hazard in theaters.



At the upper left is an exterior view of the State Theater and at the lower left an interior view of the Boulevard. Both of these show "houses" are in Baltimore, Md., and were equipped with "Freon" air-conditioning systems made by Frick Company, Waynesboro, Pa.



The American Theater, Evansville, Ind., and the Rialto Theater, Wilmington, Del., shown at upper and lower right, are kept cool and comfortable with "Freon" air-conditioning equipment made by Westinghouse.



**FREON**  
REG. U. S. PAT. OFF.  
*a safe refrigerant*

KINETIC CHEMICALS, INC., TENTH & MARKET STREETS, WILMINGTON, DELAWARE



## Industry Can Solve Its Own Problems

(Opinions of Industry Executives Continued from Page 1)

### McCRAY

**Says Decisions Clear Way  
For Better Business**

Kendallville, Ind., June 3.  
Our industry can best solve its own problems without Government interference or regulation. Think decision of Supreme Court helps clear the way for improved business.

E. E. McCRAY,  
McCray Refrigerator Co.

### FRICK

**Doesn't Want NRA  
Continued in Any Form**

Waynesboro, Pa., June 3.  
Do not believe NRA should be continued in any form. Necessary regulation by Government, some of which is unquestionably indicated, can, in my opinion, be accomplished by laws enacted and within limits of the Constitution as it now is written. No amendment necessary or even desirable. Recent Supreme Court decisions will greatly help all heavy machinery industry including refrigerating machinery. We will now begin buying new production equipment to replace obsolete and generally step up all activities. The Frazier-Lemke decision is especially valuable to all vendors who extend credit to their trade.

FRICK CO.

### ARMSTRONG

**Constitutional Government  
Transcends Any Program**

Lancaster, Pa., June 3.  
Supreme Court decision welcomed by everyone interested in maintenance of constitutional government. That principle transcends any particular program. NIRA has left definite impression on thought and policies of industry and some of its objectives should be included in program for future.

Industry with cooperation of Government and labor and the use of the Federal Trade Commission and by appropriate state laws can solve the problem. Trade associations of which we are members making every effort maintain status quo.

This company has made no change in policies or operations and industrial and retail situation in this locality appears to be unchanged.

ARMSTRONG CORK PRODUCTS CORP.

### KRITZER

**Says Nation Must 'Sweat,  
Through Recovery Period**

Chicago, Ill., June 3.  
The "Prosperity Special" ran off the track in 1929. The New Dealers strove mightily to repair the wreck and after two years of golden sweat suddenly discovered they had returned the special to rubber tracks. Now the question is whether to rebuild the train of rubber to fit the rubber tracks or sweat through another period to replace the train on the steel tracks. There can be but one answer.

R. W. KRITZER,  
Peerless Ice Machine Co.

### LINDSAY

**Hails Return of Business  
To 'Business Men'**

Chicago, Ill., June 4.  
My feeling clear that any permanent NRA will merely transfer business and industrial initiative and responsibilities from business executives to growing horde of political appointees. I do not think the record of latter over past 20 years compares favorably with record of former in matter of abuses and personal aims. Supreme Court decision will only have effect on Refrigeration Industry which the industry itself may cause them to have.

HARVEY B. LINDSAY,  
President, Dry-Zero Corp.

### LYLE

**Calls for Revision of  
Anti-Trust Laws**

Newark, N. J., June 3.  
Believe minimum wage in some industries very desirable, both from standpoint of labor and capital as a chiseler works on both. Government interference and Government competition undesirable to business. Anti-trust laws should be revised to permit trade associations to discuss problems legally as they have been doing supposedly legally under NRA. The Constitution should remain as our firm foundation for Government as at present. Believe near future will demonstrate Supreme Court's decision helpful to refrigerating industry.

J. I. LYLE,  
Carrier Engineering Corp.

### WILLIAMS

**Contents Business Can  
Best Regulate Itself**

Bloomington, Ill., June 3.  
This organization is satisfied to stay with the Constitution and feel no need whatever of NRA being continued. We think business will advance rapidly if left to regulate itself. Anticipate no ill effects on Refrigeration industry from Supreme Court decision.

C. U. WILLIAMS,  
Williams Oil-O-Matic Heating Corp.

### BAPPLER

**Not in Favor of Changes  
In Constitution**

Hartford, Conn., June 3.  
We are decidedly not in favor of constitutional changes that would make permanent regulations governing business such as NRA did in emergency. Industry can solve its own problems and has learned value of cooperation. Believe Refrigeration industry well qualified by its executive personnel to meet present situation with good judgment and that progress will be continued.

C. T. BAPPLER,  
The Bush Mfg. Co.

### POTTER

**Believes Old Principles  
Are Still the Best**

Buffalo, N. Y., June 3.  
To change the Constitution in order to perpetuate the scheme of building a gigantic bureaucracy for the Government of the American people would constitute one of the big crimes of history. I may be called old fashioned but I still ardently believe that the spirit and principles which lifted the American people to the status of a great nation can be depended upon to carry us through any temporary setbacks. So far as the refrigeration industry is concerned, its foundation rests on the backs of the dealers and not on the manufacturers as some seem to believe. The survival of the fittest among the manufacturers will depend on one thing, namely their ability to make profits for the dealers and all the loud cries for assistance from Washington will not change the principle.

T. IRVING POTTER,  
Potter Refrigerator Corp.

### PENN

**Resents Theorists Meddling  
In Business**

Des Moines, Iowa, June 3.  
We are rejoicing and most thankful that our Supreme Court has confirmed our long time conviction that NRA was unconstitutional. We strongly resent governmental meddling by theorists, demagogues, and politicians. The recent Supreme Court decisions we believe will go down in history as some of the most momentous decisions ever rendered by this court since it leads us back to fundamentals. With these wild schemes legally dead, businessmen everywhere will now be more optimistic.

ALBERT PENN,  
Penn Electric Switch Co.

### BATCHELDER

**Claims Self Government  
Will Eliminate 'Chiseling'**

Chicago, Ill., June 3.  
Feel that NRA plan under which our industry has been operating contains many things of value to public and to industry, which should be retained, such as open price filing, some fair trade practice regulations, plus opportunities for exchanging views, resulting subordination of selfish interest to collective benefits along lines of mechanical and economic progress.

Believe if they were permitted to do so most major industries of National scope could solve majority of policy problems themselves despite chiseling of selfish minorities always prevalent in every industry. This self government has proven itself capable even under NRA operation which lacked proper enforcement and there is no reason to believe situation would be different under some other form of Government regulation.

If refrigeration industry can retain the meritorious features of the NRA structure under which it has been operating whether through voluntary self government or through Government regulation, they could preserve large part of stability which has been evident in recent months and possibly prevent reversion to former chaotic state of marketing of their products.

E. H. BATCHELDER, JR.,  
The Insulite Co.

## Servel to Maintain Wages & Hours

The following statement of Servel policies was made following the Supreme Court decision nullifying the NRA, and was published in the May 31 issue of "Servel Inklings" over the signature of Louis Ruthenburg, president of Servel, Inc., New York City and Evansville, Ind.:

THE recent decision of the Supreme Court of the United States, dealing with the National Industrial Recovery Act, has occasioned a number of inquiries as to possible changes in policies and practices which may affect our people.

At present, we find no reason for changing such policies and practices. The Recovery Act and the codes under which we have operated, affected conditions of employment as follows:

- (1) Child labor was prohibited.
- (2) Minimum wages were prescribed.
- (3) Maximum hours were stipulated.
- (4) Section 7a provided that employees should have the right to organize and bargain collectively through representatives of their own choosing.

As a matter of humanity, of public interest and of fundamentally sound company policy, and without reference to legal requirements, we believe that child labor should not be employed in manufacturing plants.

There is no apparent reason for present change in minimum or other wage standards which are now in effect.

The present schedules of working hours seem to be reasonably satisfactory to our people and to the management. No change will be made until sound reasons develop for such change.

The policy of the Recovery Act with respect to maximum hours undoubtedly resulted, on the whole, in more equitable distribution of available work, and in reducing unemployment. It was a logical development of the "Share the Work" movement that preceded the Recovery Act. Until general employment conditions are further improved, there are sound reasons for continuing to operate under present schedules of working hours.

Our people have elected the Servel Workers Council as their representatives for collective bargaining. This organization has faithfully served the interests of its constituents. It has demonstrated that much good can be accomplished by effective and constructive partnership between management and men. There is no apparent reason for changing practices or policies with respect to the Servel Workers Council.

Future policies and practices which affect our people will continue to be based upon the sound principles that the interests of the corporation and of the people on its payrolls are mutual, and that the greatest good for all of those affected by the operations of Servel, Inc., can only be accomplished by fair policies with respect to wages and working conditions.

LOUIS RUTHENBURG.

### HIGLEY

**Thinks Chief Benefits  
Should Be Retained**

Marinette, Wis., June 3.  
Believe wholesale government regulation of business is always destined to failure. Chief benefits in NRA should be retained, namely, abolition of child labor, and sweat shop, and slave wages. However, frankly admit that means of accomplishment with or without Government regulation presents very difficult problem. Believe Constitution and Supreme Court bulwark of nation against crazy ideas. Expect recent Supreme Court decision will have little effect on Refrigeration industry as all manufacturers concerned are type that needed little or no regimentation. Trade association should be continued and strengthened to effectively control unethical practices.

H. V. HIGLEY,  
Ansul Chemical Co.

### WYLLIE

**Claims Decision Will Not  
Harm Business**

Detroit, Mich., June 3.  
First question definitely no. Believe industry can and will solve own problems, although in some instances modified Government regulation could be helpful. Do not believe that Supreme Court decision will materially affect industrial relations in Refrigeration Industry but temporarily may curtail sales pending readjustment. Even there, however, the ultimate effect should be beneficial.

JOHN WYLLIE, JR.,  
Sales Manager,  
Temprite Products Corp.

### O'KEEFE

**Thinks Minimum Wage  
Laws Are Necessary**

Los Angeles, Calif., June 4.  
Believe some plan is necessary to control minimum wages and maximum hours, which should be same in all industries if it is possible to accomplish this without a collective bargaining clause. With this protection against labor chiseling and not encouraging union labor, the industry can probably solve balance of its problems.

D. P. O'KEEFE, President,  
O'Keefe & Merritt Co.

### GILFILLAN

**Says NRA Has Served  
Its Purpose**

Los Angeles, Calif., June 4.  
NRA has served its purpose. Manufacturers successful to this point will maintain wages and should know how to run their business. Supreme Court decision will cause chiselers this year, which manufacturers and distributors can work out through their own franchise agreements.

GILFILLAN BROS. INC.

### REMPE

**Favors Any Plan Having  
Support of Industry**

Chicago, Ill., June 3.  
We are in favor of any plan that is sponsored by the majority of the members of the Refrigeration industry.

REMPE FIN COIL CO.

### FORBES

**Thinks Flexibility in  
Constitution Desirable**

Pittsburgh, Pa., June 3.  
I believe the world has changed a lot since the Constitution and it should be flexible enough to meet new economic conditions. Transportation and communication have so greatly improved as to outmode too much emphasis on separate states rights to the detriment of Nation as a unit.

Believe industry needs some basic National regulation for child labor, minimum wages, maximum hours, and the major unfair trade practices such as continued selling below cost and price discrimination of favored classes.

Industry should control individual pricing and trade policies to prevent stifling initiative. Believe NRA should be improved on the basis of experience instead of scrapped. Think decision will have detrimental effect on industry.

JOHN S. FORBES,  
Kerotest Mfg. Co.

### PARKER

**Decision Will Help the  
Small Manufacturer**

Los Angeles, Calif., June 4.  
We believe industry can solve its own problems and that recent Supreme Court decision will prove helpful to the small manufacturer. NRA should be discontinued for above reasons.

PARKER MFG. CO.

### ARNOLD

**Bitterly Opposed to Any  
Constitutional Change**

Providence, R. I. June 3.  
Am bitterly opposed to any change in Constitution to enable continuance NRA in any form. Industry can solve its own problems now as always before. Recent Supreme Court decision most encouraging.

EDWIN H. ARNOLD,  
Liberty Refrigeration Corp.

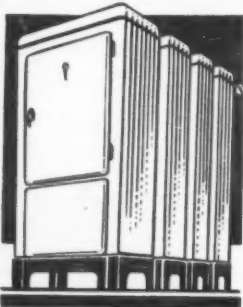
● Extra Dry ESOTOO  
LIQUID SULPHUR DIOXIDE

● V-METH-L  
METHYL CHLORIDE

**VIRGINIA  
SMELTING  
Company**  
WEST NORFOLK, VA.  
131 State St., Boston, and  
76 Beaver St., New York

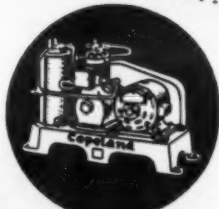
**MEET any COMPETITION with COPELAND!**

**FOUR BEAUTIFUL MODELS  
THAT COVER ALL HOME NEEDS**



Copeland deliberately built this small compact 1935 line to appeal to the demands of the great majority of today's buyers. Four models in restrained design, dignified and in perfect taste. The beauty, quality and value is apparent at a glance. Copeland is quality-built, priced right and easily sold—without danger of costly service losses later. A line that can build a big year for you. Investigate Copeland's possibilities.

**4  
MODELS  
All fast  
Movers**



**24 MODELS MEET ALL  
APPLICATIONS IN THE  
BIG COMMERCIAL FIELD**

You can advantageously bid on any kind of a commercial installation with this broad line of Copeland Commercial Models. Copeland engineering and design assure considerable operating economy. This big Copeland commercial field is a real money-making opportunity for energetic distributors everywhere. Write for details.

**24 Models**

**COPELAND REFRIGERATION CORPORATION**  
Manufacturers of a Complete Line of Household and Commercial Refrigeration  
Holtz Ave. at Lincoln ... DETROIT, MICH.

**Copeland**  
DEPENDABLE Electric REFRIGERATION



## What They Think About the NRA In Other Industries

### Code Score: No Hits; No Runs—Many Errors!

(From *The Inland Printer*)

**S**ELDOM has a nation adopted a new law with higher ideals and finer intentions than prevailed with passage of the Volstead Act. Seldom was a measure more hotly defended than prohibition when courageous Nicholas Murray Butler first uttered publicly the rumbling discontent that disturbed the country, and called prohibition wonderful in theory but unenforceable in actual practice. After 18 years of trial and error came repeal.

Seldom has an industry adopted a measure for trade improvement more willingly, more hopefully, and with higher ideals than did printers adopt the graphic arts code of the National Recovery Act.

That the graphic arts code has failed to accomplish its original high purpose none will deny. That it has been a disappointment, if not a dismal failure, is generally conceded. Its most ardent supporters, today confined largely to those who have earnestly and valiantly endeavored to make it work, attribute its faults to lack of "enforcement."

Principal charges leveled against the code, or its lack of enforcement, are:

*It has not stabilized prices.* In the past, every organization set up, in whole or in part, to influence or "make" printers sell at agreed prices has failed. Foremost among code trade-practice regulations is the machinery set up for stabilizing prices. Code agencies insist that price stabilization is not merely another name for "price fixing." Printers, on the other hand, maintain that no matter how cunningly disguised as "selling on economic hour rates" or in "price determination schedules," it still is plain, old-fashioned "price fixing."

But, devices for determining costs received scant attention in preparing codes, and have all but been thrown out the window in the eagerness of officials to comply with the law by confining "enforcement" to mere "code activities." Code officials could not go into court with a charge that some printer was selling below cost when there was no legal way to determine what cost should be. This is the rock on which much "enforcement" effort foundered.

*Selfish interests exploited code "enforcement."* Many printers protest that weaknesses not only crept into the original building of the code, but that others were purposely injected by selfish interests that found opportunity to organize and fix code administration to their own liking.

*The code set up another bureaucracy.* Another frequent charge is that only beneficiaries of the code are those men and women employed in Washington as executive vice presidents, secretaries, or as regional and local code directors, deputy directors. Today there are hundreds of these employees where dozens existed before. Many are listed to receive salaries double what they got 18 months ago, before advent of the code. It is claimed that added personnel and increased salaries comprise the bulk of administration expense.

*Codes are all administration and no service.* Common is the complaint that code expenditures can be made only for "enforcement"; that service expenditures are made at the personal risk of officials, or only in the event an "extra" fee is paid. *Services were the backbone of association activities for years.* Printers miss them, and complain that they get no benefits from code "enforcement." Some stopped paying. Their neighbors are waiting, in some cases hopefully, for something to happen.

*Labor has not benefited.* Though organized Labor was unable to turn Section 7a to its account, as originally expected, it still endorses NRA, but hopes for better luck with the 30-hour bill, and Wagner bill. Unorganized labor, a generous half of the printing-trades employees, seems satisfied with regulated minimum wages, maximum hours, and working conditions brought by the code. But all labor is fearful that the increased printing prices, made necessary under code operation, will ultimately decrease volume and increase unemployment; that benefits of increased wages will be offset by higher living costs.

*Business has not been helped.* Management, as represented by personal interviews and hundreds of letters from printers in all parts of the country, reports: "Prices were never more shot to pieces." "More competition than ever." "We have to do more work for an order than ever before." "Profit on an order is exceptional." "It costs more to operate under the code." "Buyers can't afford our prices, and use cheaper duplicating processes."

*Chiseling has not stopped.* Unfair competition, unnoticed in prosperity, looms up ominously in depression, yet

there have been few complaints to code agencies. Printers, while still protesting sharp practices and unethical conduct, refuse to complain against neighbors and competitors for fear of retaliation. Code authorities remain helpless without complaints. Government, possibly avoiding Supreme Court rulings, lacking precedent—and complaints—waits in vain to act. Chiseling goes on, unabated.

*The code has done nothing industry would not do for itself.* Some feel the code has advocated nothing that has not been in the hearts and minds of employing printers for 50 years.

A revival of more comprehensive associational service activities, rather than inadequate and unsatisfactory code "enforcement" is already apparent in the more successful associations. Officers and directors of these groups are not "throwing down" the code; rather, they are managing to give paying members "something for their money."

Summarizing charges leveled against code "enforcement," one can only conclude that the code, as now operated and handicapped, is a farce and that unless it can adopt a few simple, enforceable activities, such as regulations affecting hours, wages, and child labor, its seconds should throw a towel into the ring and let the show go on.—*The Inland Printer*, May, 1935.

### The Death Blow to Bureaucracy

(From *The Iron Age*)

**T**HE Supreme Court has spoken. By unanimous decision, it has turned thumbs down on the brain trusters and constitution "busters" who for two years have been attempting to build a super-government in America, a consolidated clan of bureaucracies having the assumed power to make and enforce our laws.

The importance of this decision goes far beyond NRA, with which it was immediately concerned. As a matter of fact, the blue eagle has been dead for months and the decision merely gives decent burial to a corpse which the Administration would have embalmed, like Lenin's body, and kept exposed to public view for two more years. Beyond the *requiescat in pace* which the decision pronounces over NRA, its broad and emphatic terms also sound the death knell for the Wagner labor disputes bill, the Black 30-hour week bill, and all of the other pending legislative measures which are so manifestly and unconstitutionally conceived in class interest.

It is true that, in certain industries, there have been beneficial results from operating under codes, in the form of better trade practices. In such instances, however, observation shows that quality of leadership in the industry and willingness to cooperate among its members have been responsible for success. It has not been achieved through mandate of Government. But even if it had been, the price would have been exorbitant in the long run. For no measure of immediate gain can compensate when purchased at the cost of a mortgage to bureaucracy. Nor are such gains commensurate with the greater losses occasioned by the lack of confidence engendered by a trend toward State socialism.

That trend has now been definitely checked. The Supreme Court decision will go far toward restoring business confidence and to encouraging our great army of fear-frozen investment dollars to go to work. Steel and the capital goods industries will shortly feel the impetus of renewed buying that will follow the smashing of the strange gods and brazen images of a regimented economy and a philosophy of scarcity. The Schechter chicken has broken the American goose step.

Industry now has an opportunity to demonstrate its fitness for self-government. But obligations go with this charter of freedom, the obligation to preserve high standards of trade and business practice and to refrain from labor exploitation in hours and wages. Voluntary association to this end, under the code of the Golden Rule, is not prohibited by the Supreme Court decision and it will take us much further than laws merchant and hosts of blue eagles.—*The Iron Age*, May 30, 1935.

### The Passing of the Codes

(From *Advertising Age*)

**T**HE invalidation of NRA codes by the decision of the United States Supreme Court is of tremendous significance from an advertising and marketing standpoint. Practically all of the hundreds of codes contained fair practice provisions which dealt in detail with merchandising methods, and in many cases specified the kind and amount of advertising and sales promotion which could be done.

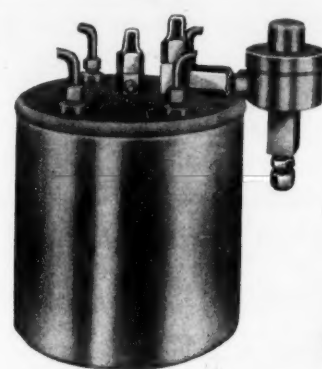
Inasmuch as the court held that code-making is essentially a legislative function which cannot be delegated to the executive branch of the govern-

ment, it will be impossible to give codes the force of law without incorporating them into the statutes. It seems doubtful that this will be done. In addition, the court nullified any attempt on the part of the federal government to deal with intrastate commerce, which means that no law containing the equivalent of code regulations can be enacted which will apply to an entire industry, including local and intrastate units as well as those operating in interstate commerce.

It seems to us, therefore, that the codes, as they have been operated for the past two years, cannot be continued, and that the only logical substitute for them will be cooperative, voluntary action on the part of the associations representing the various trade and industrial groups. Without the backing of governmental authority, it is unlikely that associations can bring about complete uniformity of action in competitive practices, especially in the numerous details of policy and methods covered by most of the codes.

The basis of the NRA was regimentation of industry and trade for the general welfare. Naturally, such a policy tended to interfere with competitive effort in many directions. Inasmuch as advertising is the direct expression of competitive activity, the withdrawal of code restrictions should have the effect of increasing advertising and sales promotion efforts. The brakes have certainly been taken off, as far as restriction of individual effort is concerned, and any manufacturer or merchant can now step out and adopt whatever merchandising plan seems to offer the greatest possibilities from his standpoint.

Advertising should benefit immediately and directly, however, as business men find it necessary to extend competitive effort and to protect their sales and good-will in a market which is no longer under control through code regulations.—*Advertising Age*.



## ANOTHER BOOM GETS UNDER WAY

Throughout the country permanent licenses are now being issued to beer dispensers.

This, together with the improved financial condition, is removing the uncertainty from the future of the beer retailer and means that the better and more responsible class of dispensers are going to stay in business and are now ready to invest in permanent and up-to-date refrigerating equipment.

For the sake of your own reputation and likewise the reputation of mechanical refrigeration, do not spoil this wonderful market by attempting to sell beer cooling systems which are new and untried and which may not operate satisfactorily.

Sell Temprite, the world's outstanding beer cooler, with its unmatched record of success and experience in the beer cooling field. Instantaneous cooling... foam control... temperature control... and economical operation, are features which your prospects require and which only Temprite can successfully furnish.

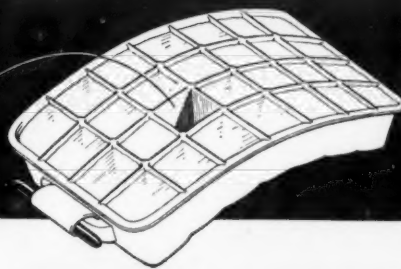
The boom is under way. Take advantage of it with Temprite.

### TEMPRITE PRODUCTS CORPORATION

1349 EAST MILWAUKEE AVENUE  
DETROIT, MICHIGAN

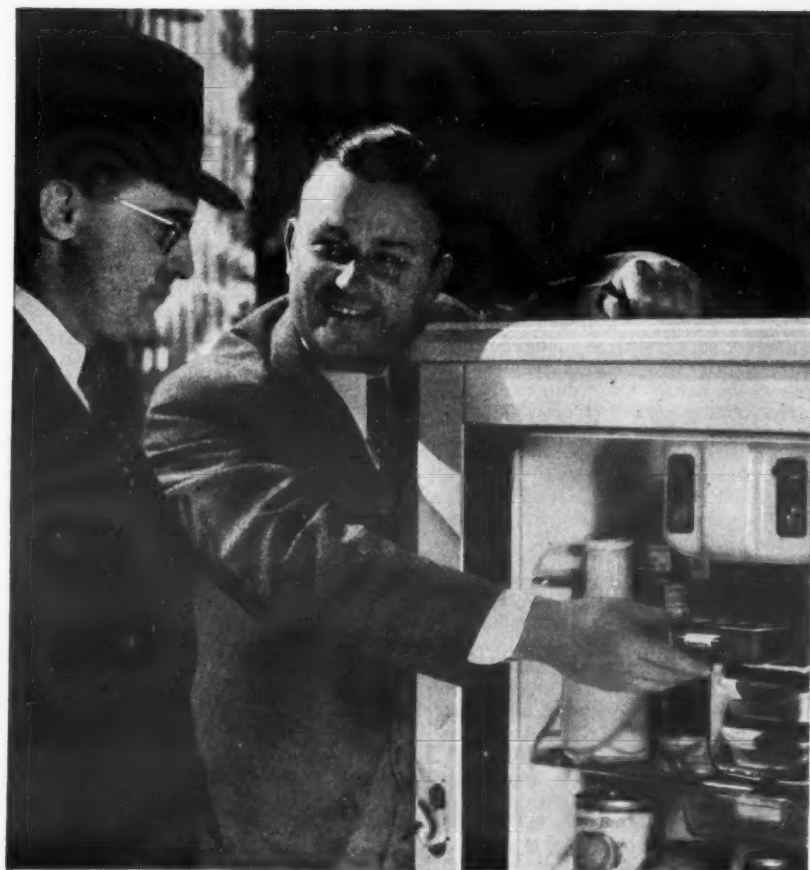
ORIGINATORS OF INSTANTANEOUS LIQUID COOLING DEVICES

## A TRAY FULL OF TRICKS!



### "COLD FACTS" No. 7

Selling becomes easier when all models of the refrigerator you sell have Flexible Rubber Trays or Grids! INSIST that all models come factory-equipped! Write to your manufacturer or direct to us. The Inland Mfg. Co., Dayton, Ohio.



Customer: "...and does this other model also come with Flexible Rubber Trays?"

Salesman: "Yes, indeed! Every model of our refrigerators has this up-to-date convenience!"

No Refrigerator is Truly Modern Unless it Has  
**Flexible Rubber Trays or Grids**  
—and the Public Now Knows it!



## AIR CONDITIONING

### Many Omaha Firms Installing Comfort Cooling This Year

OMAHA—That air conditioning, the answer of science to the vexing problem of dirt and weather in business, and in the home as well, is stepping to the fore in Omaha and the coming summer will find it presented to the public in dramatic style, particularly if dust storm persist, is the prediction of Frank L. Campbell, air-conditioning manager, Nebraska Power Co.

Omaha, estimates Mr. Campbell, has over 500 commercial and 12 residential air-conditioning installations to date. Largest project of the kind, so far, is the complete air-conditioning of the Insurance building, purchased two years ago by the Woodmen of the World Life Insurance Association, and now being renovated.

Largest hostelry project in the mid-west, says Mr. Campbell, is the air conditioning of three floors of the Paxton hotel. The new system will affect the main ballrooms and private dining rooms on the mezzanine floor, the main dining room and cocktail room (and to some degree the main lobby) on the ground floor, and the coffee shop, barber shop, and other basement areas.

#### Installations in 1935

Installations in Omaha for 1935, according to Mr. Campbell, will include the following:

Union Station restaurant, W. T. Grant store, eighth floor of the Electric building (including executive offices of the Nebraska Power Co.), General Electric offices in the Electric building, Napier's Booterie.

Executive offices of the Nebraska Consolidated Mills, an addition to the Fontenelle hotel's group of air-conditioned rooms and parlors, Crosby Mortuary, Buck's Booterie, Miller-Hasselbach offices, Max Holzman home, and "The Southern Mission."

Pioneers in the field of air cooling and air conditioning were the downtown theaters—the Orpheum, Brandeis, Paramount, and Omaha. Two years ago conditioning was installed in the following:

Haas Brothers store, Metropolitan Drug Co., Somborg's Cafe, Jack and Jill Shop; Hotel Hill, Rivett Lumber Co., Baker Ice Machine Co., Omaha Printing Co., J. H. Ruston (residence), Yellow Cab Co., Blackstone Pastry Shop, and Howard Drug Co.

#### Jobs Sold During 1934

Air-conditioning installations made during 1934 included the F. & F. Cough Drop Co., Balbach Co., York Ice Machine Co., Western Air Conditioning Co., executive offices of the Woodmen of the World Life Insurance Association, Brailey & Dorrance mortuary, Berland's, Nebraska Power Co., Kunold Mortuary, Grain Dealers Mutual Fire Insurance Co., Myles Standish residence, Electric Housekeeping, Inc., Dr. Edwin Davis residence, Wright & Wilhelmy Co., Lido Cafe.

Charles Metz residence, Douglas County hospital, Maisin Lorenzo, Florshelm Shoe Co., Dollar Crystal Co., Grant McFayden, J. M. Fernald home, Aquila Court Tea Room, Karl Louis Home, Greenlease-Lied Motors, Mayfair Club, George Bowman, A. A. Nelson, J. J. Hannighen, Glenn Boyles, Robert Morsman, George Brandeis, Texas Crystal Co., Hosman's Restaurant, and Armour & Co.'s offices.

In the installation of these air-conditioning units, said Mr. Campbell, the Baker Ice Machine Co. of Omaha has been prominent. Many were installed by the Carrier, York, Frigidaire, General Electric, and Allen Ice Machine companies.

"Air conditioning," declared Mr. Campbell, "means more than cooling the air inside a building in the summer time. It means the control of temperature, to be sure, to a level more comfortable than that outside. But, in its broader sense, air conditioning deals with the cleansing, humidifying and otherwise preparing air for more profitable human consumption.

"Scientists declare," he continued, "that man rarely realizes how much he depends upon the air he breathes for energy, health, and comfort. Removal of impurities from the air in rooms where many men and women are working will benefit them greatly."

"In a recent test conducted in New York on a particular dirty day, a cubic mile of air was found to contain 5,000 lbs. of foreign matter, 2½ tons. Of this 65 per cent, or 3,250 lbs., was made up of carbon products, such as unconsumed coal, gasoline, motor oil, carbon monoxide, and other elements forced into the air by mechanical agencies. Fifteen per cent, or 750 lbs., was mineral ash; and 20 per cent, or 1,000 lbs., was made up of germs and septic matter."

### C. Wallace Plumbing Co. Dallas Distributor For F-M Systems

DALLAS—C. Wallace Plumbing Co. has been appointed distributor for the Fairbanks-Morse air-conditioning equipment in the Dallas territory, reports R. H. Morse, manager of the Dallas branch, Fairbanks-Morse Co.

C. Wallace, head of the company which bears his name, states that new equipment and a building to house a large sheet metal shop is being added to the company's properties to handle the air-conditioning business.

Mr. Wallace is not a newcomer to the air-conditioning field, having supervised installation of air-conditioning equipment in many of the larger buildings of the southwest, including the Dallas Power & Light building and the Gulf States building in Dallas.

Associated with him are his two sons, Frank and S. P. Wallace.

### H. Schaffner Distributes Strang Line in Ohio

MARION, Ohio—H. Schaffner Co. of this city has been appointed distributor for Strang air-conditioning equipment in the following counties in Ohio:

Marion, Morrow, Hardin, Union, Delaware, Wyandot, Crawford, Hancock, Richland, Ashland, Knox, Allen, Logan, Licking, Muskingum, Franklin, Champaign, Clark, Montgomery, Green, Stark, Wayne, Holmes, Coshoc-ton, and Madison.

### Apartment Installation Uses Unit in Closet, Machine in Pantry

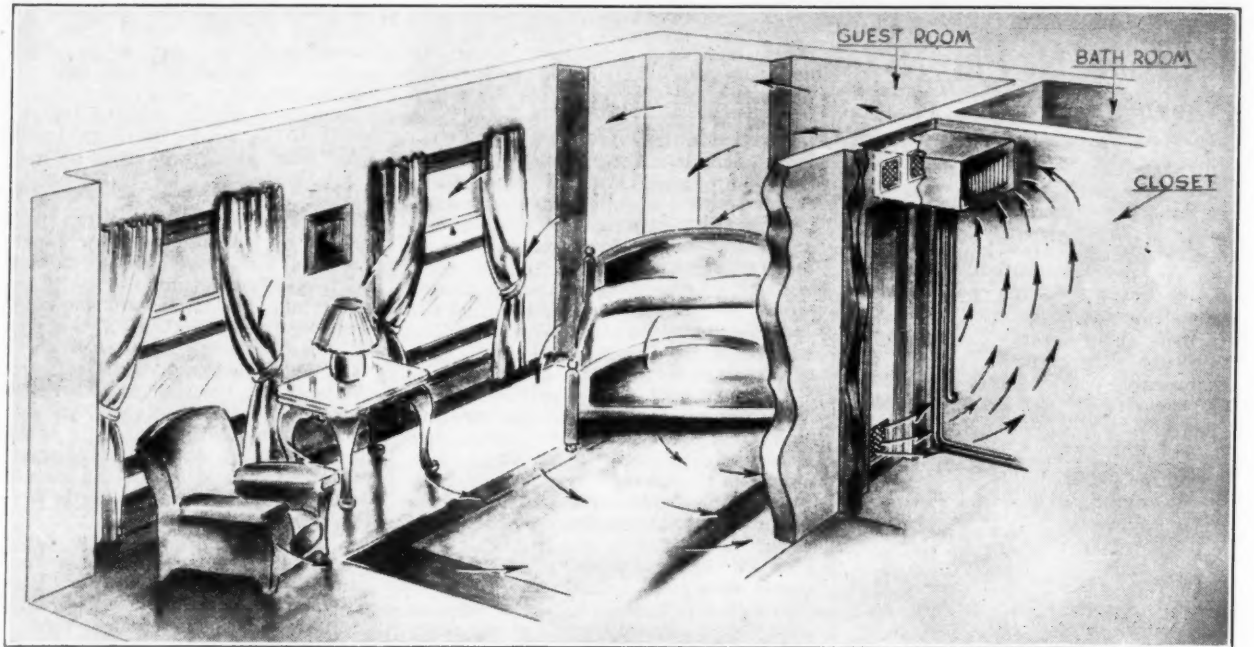
CHICAGO—An air-conditioning system somewhat unique in design has just been completed by the Kroeschell Engineering Co. of Chicago in the "Gold Coast" apartment of Aldis Browne of Ross & Browne, real estate operators and building management firm.

The air conditioner is located on a shelf in the coat closet of the reception hall. The reception hall, dining room, living room, and master bedroom are supplied with conditioned air from this central unit. The system is so designed that the full amount of conditioned air can be directed into any of the rooms as desired.

The reception room is located between the living room and the dining room. Conditioned air from the grille above the doorway in the hall is distributed into the living room. Similar grilles openings supply conditioned air to the dining room and bedroom.

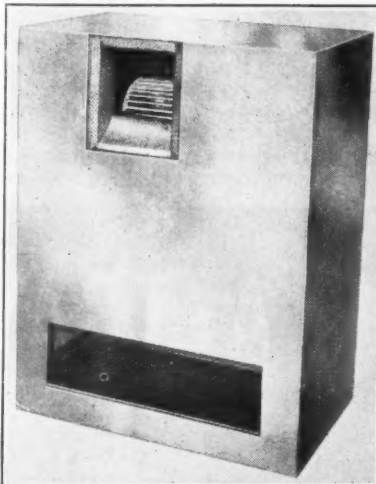
An ideal space for the refrigerating machine was found underneath the sink in the butler's pantry, where it is out of the way and hidden from view.

### Closet Installation for Hotel Room



Cutaway view of a typical hotel room showing the manner in which one of Frigidaire's new hotel unit air conditioners will supply comfort cooling for guests. Model shown here is of low, horizontal design, with air return through the rear.

### New Frigidaire Unit Designed for Hotels



Vertical design hotel room air conditioner with capacity of 1,000 lbs. I.M.E. per 24 hours.

(Concluded from Page 1, Column 1) installations more practicable.

To provide a wide range of versatility these air conditioners are available in two distinct types each of which are produced in both one ton and one-half ton capacities. The series H. U. 50 and H. U. 100 are low in design and provide for return air through the rear, while models HU 51 and HU 101 are of the vertical design with provision for return air through the lower end of the front panel. This front opening can be grilled directly or be placed adjacent to wall openings which are fitted with louvers, grilles or screens.

Both one-ton units are equipped with double centrifugal blowers and the ½-ton units have single blowers. Compressors required for operating these units may be located at any convenient point in the building.

### 11 Air Conditioners Sold in Buffalo

BUFFALO—The 11 air-conditioning installations made in this city during 1934 exactly equalled the total number of air-conditioning installations made in all years previous to last year, and exceeded by five the total number made during 1933.

It is interesting to note that only one residence has been installed with air conditioning in the city of Buffalo, and that installation was made during 1934.

Three hotels, totaling 35 hp., and two jewelry stores, totaling 9 hp., were air conditioned during 1934. Other installations made last year included a restaurant, a hospital, a drug store, an electric company sales office, and a store.

Largest installation, from the standpoint of the size of the units, were made prior to 1933 when four theaters with a total horsepower of 1,000 were air conditioned. A candy manufacturing plant also installed air conditioning the same year.

During 1933, three offices, one bank, and two drug manufacturing companies were air conditioned.

Although air-conditioning installa-

tions made during 1934 were more numerous than those made during previous years, the average size of the units ranked lowest, as may be seen from the following table showing the average horsepower of units installed:

	No. of Instal- lations	Total Connected Hp.	Average Hp. Per In- stallation
During 1934..	11	120½	10.95
During 1933..	6	100½	16.75
Before 1933..	5	1,040	208.00

### Kelvinator Describes Air Conditioning For Homes

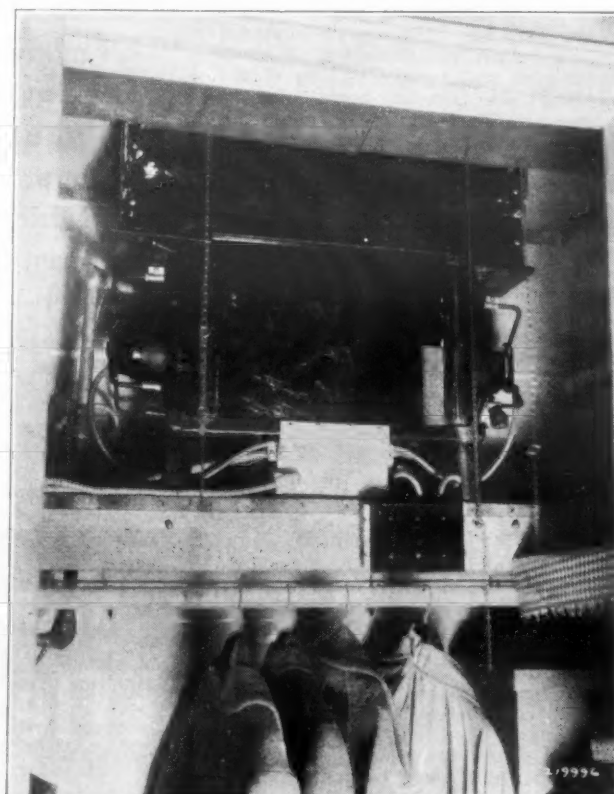
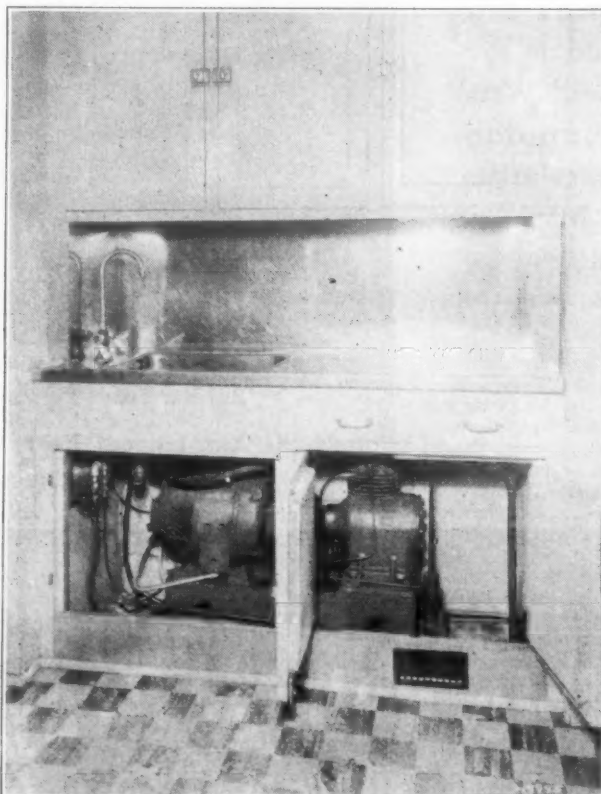
DETROIT—Describing the advantages of air conditioning for homes and offices, a new, eight-page folder recently was placed in the hands of dealers by Kelvinator Corp.

Through the use of photographs and copy, the folder presents a complete picture of the benefits of Kelvinator air conditioning installations in homes, business offices and offices of professional men. The folder also shows some of the 63 units in Kelvinator's air-conditioning line.

### Buffalo Air-Conditioning Jobs

Type of Establishment	Prior to 1933 No.	During 1933 Hp.	During 1934 No.	During 1934 Hp.	Total Thru 1934 No.	Total Thru 1934 Hp.
Offices .....	..	3	5½	..	3	5½
Restaurants .....	..	..	..	12	1	12
Hotels .....	..	..	3	35	3	35
Residences .....	..	..	1	15	1	15
Hospitals .....	..	..	1	2½	1	2½
Drug Store .....	..	..	1	22	1	22
Jewelry Stores .....	..	..	2	9	2	9
Miscellaneous Stores ..	..	..	1	5	1	5
Elec. Co. Sales Office ..	..	..	1	20	1	20
Theaters .....	4	1,000	..	..	4	1,000
Banks .....	..	1	80	..	1	80
Drug Manufacturing ..	..	2	15	..	2	15
Candy Mfg. ....	1	40	..	..	1	40
Totals .....	5	1,040	6	100½	11	120½

### Utilizing Closet Space for Apartment Installation



Kroeschell Engineering Co. of Chicago recently installed an air-conditioning system for an apartment, in which the central conditioning unit was placed in a closet off the reception hall, and the refrigeration machine underneath the sink in the butler's pantry.

### Utility Book Illustrates New York Installations

NEW YORK CITY—Facts, figures, and photographs regarding air-conditioning installations in restaurants, hotels, and night clubs in and around New York are given in an attractive 32-page booklet entitled "Fresh Air for You," issued by the New York Edison Co. recently.

Complete sets of cost figures are given, showing how three restaurants increased summer business and profits by installing air conditioning. Testimonials from other users, illustrated by pictures, are given throughout the pamphlet.

Page 2 deals with what air conditioning does, namely, "gives comfortable temperature in summer, assures a comfortable amount of moisture, cleans air of dirt and dust, circulates good air, draws in fresh outdoor air, excludes noises and dust."

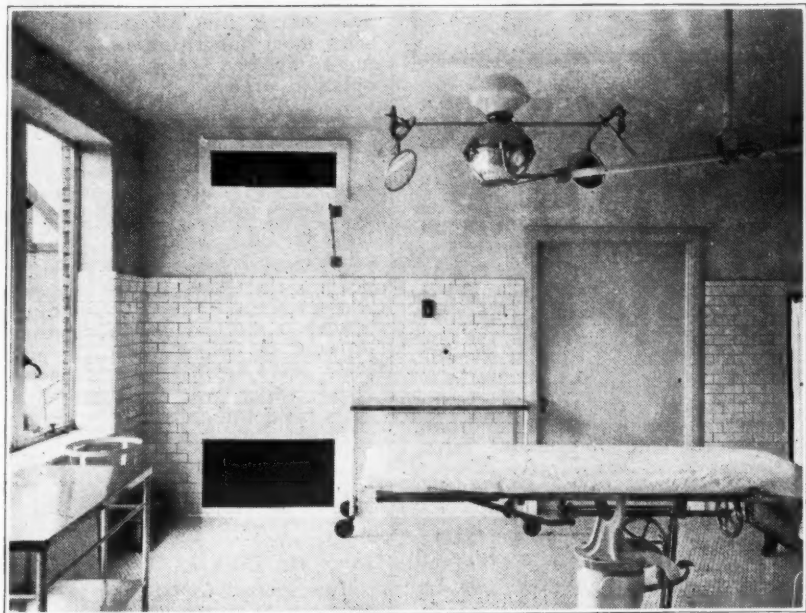
Restaurants, according to the booklet, gain big profits from air conditioning because it results in more customers, larger checks, no summer slump, contented customers, pleasant and efficient employees, less cleaning and decorating, and a powerful customer appeal.

"Air conditioning pays the night club," explains the brochure, "because patrons are happier . . . food bills are higher . . . entertainers perform better." It pays for hotels to install air conditioning in dining rooms, restaurants, bars, grills, auditoriums and meeting rooms, guest rooms, shops and stores, and offices.

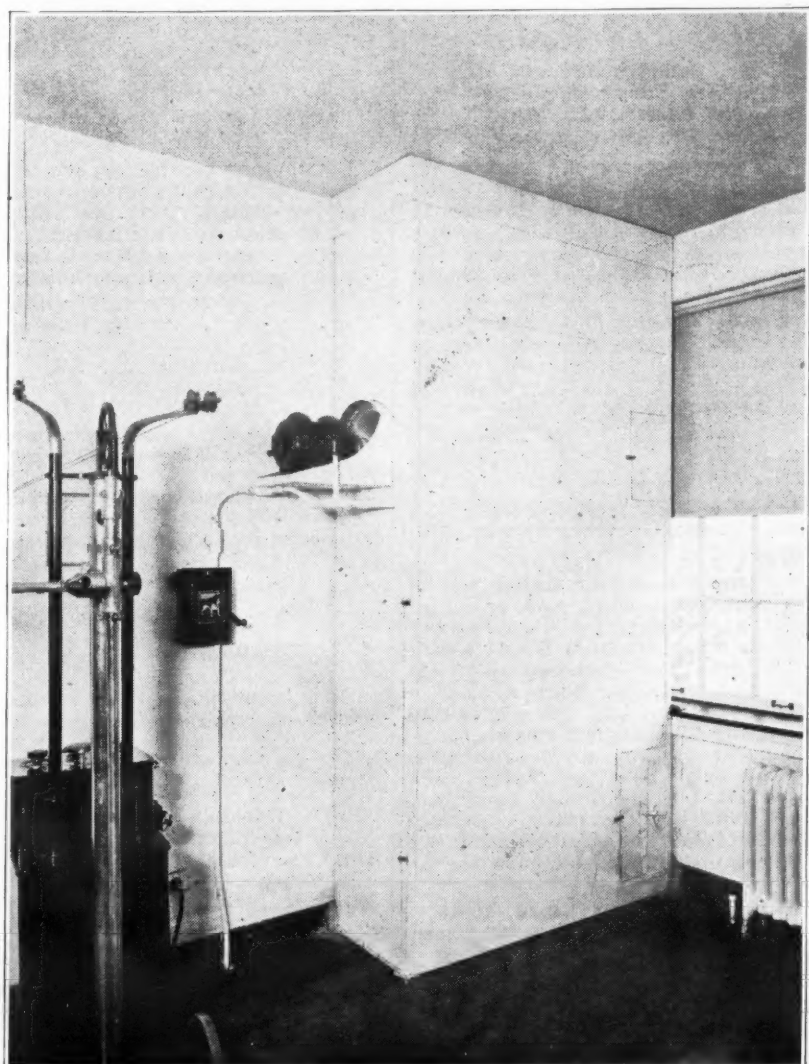
The last two pages of the booklet are devoted to types of conditioning.



## Comfort for Surgeons and Patients



Air-conditioned operating room, Kosair Hospital for Crippled Children, Louisville, Ky., showing grillework for supplying conditioned air.



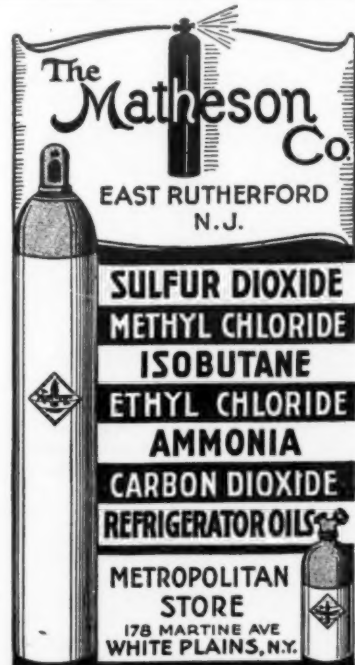
Plenum chamber installed in the X-ray room adjacent to the operating room in Kosair Hospital. The fan motor is placed entirely outside the air stream to guard against any possibility of explosion due to anaesthetics. Frigidaire air-conditioning equipment was installed.

### Booklet Tells Value of Air Cooling to Business

DETROIT—Entitled "Air Conditioning as a Business Builder," a new eight-page folder has been distributed to dealers by Kelvinator Corp.

Purpose of the folder is to tell owners of business enterprises how Kelvinator air conditioning attracts and holds patronage, and helps to overcome the hot weather slumps.

Value of air conditioning for stores and other service establishments is told in picture and copy in this folder.



### Operating Room in Crippled Children's Hospital Is Cooled by Frigidaire

LOUISVILLE, Ky.—Said to be the first in the state of Kentucky to have an air-conditioned operating room, the Kosair Hospital for Crippled Children here recently installed Frigidaire air-conditioning equipment. Installation was made by the William H. Day Co., local distributor for Frigidaire Corp.

The plenum chamber, filters, coil, and fan of the air-conditioning system are located in the X-ray room. When equipment was designed and installed, state officials of the William H. Day Co., special precautions were taken against the possibility of explosion due to anaesthetics.

Later on it is planned to connect the 2-hp. Frigidaire compressor, which provides refrigeration for the operating room equipment, to a Frigidaire SF-150 unit air conditioner to provide cooling for the staff dining room.

### Conditioners Demonstrated In San Antonio Show

SAN ANTONIO, Tex.—The first air-conditioning show in the southwest was held here May 20 to June 1 inclusive, by the San Antonio Public Service Co.

An arctic background revealed a group of icy igloos in which air-conditioning and room-cooling equipment were shown. The igloos were cooled by the units in operation. Four model air-conditioning installations were shown—a model beauty parlor, a professional office, an apparel shop, and a residence living room.

## York to Condition Air in Gold Mine By 600-Ton System

YORK, Pa.—To cool the air in the East Rand Proprietary Mine at Johannesburg, South Africa, and enable miners to tap new deposits of gold at greater depths in this region which is said to produce more than half of the world's gold output, York Ice Machinery Corp. has been commissioned by Central Mining & Investment Corp. to install a 600-ton system of mechanical refrigeration and air conditioning.

The air conditioning will be installed at the present lower levels of the mine—6,800 ft. below the surface of the earth—the farthest underground that any refrigerating system has ever been operated.

It will cool 150,000 cu. ft. of air per minute, drawing fresh air down from the earth's surface through a specially constructed air shaft. Washing, cooling, and dehumidifying of the air is to be accomplished in a York dehumidifier 18 ft. wide, 13 ft. high, and 7 ft. long.

When the air has served its purpose in cooling the mine it will be gathered into an upcast shaft, passed through a large cooling tower, forced to the surface, and discharged to the atmosphere.

The refrigerating equipment consists of two York heavy-duty four-cylinder compressors. Each one will be direct-driven by 250 hp. synchronous motors, to produce approximately 300 tons of refrigerating effect.

Condensing water for the refrigerating system is to be supplied from a "subterranean lake" of 84° F. water, 360 ft. above the 6,800-ft. level at which the air-conditioning equipment is being installed. The upcast air is

passed through this cooling tower, installed directly above the pond or "lake."

Approximately 2,000 gallons of water per minute will be circulated from this subterranean lake, through four large York shell-and-tube water coolers, and then to the air washing sprays in the dehumidifiers.

Mine operators throughout the world have been encouraged to extend their mining operations by the premium which was automatically placed on gold when several nations went off the gold standard. Thus the adoption of air conditioning for gold mining is dictated by economic reasons rather than simply by a desire to make mining a more pleasant occupation.

Each year the miners in this Rand district have been sunk to greater depths to strike rich new deposits of the precious metal. And as greater depths were reached, temperature and humidity conditions in the shafts became more and more oppressive until mine operators faced the barrier of almost impassable heat.

Rock temperatures in the East Rand Mine, for instance, are 95.7° F., and to make matters worse the humidities are exceptionally high, with the result that sustained labor at these great depths is practically impossible without some means of relieving the oppressive air conditions.

There are several factors contributing to the excessive temperature conditions. The leading one, of course, is the fact that rock temperatures increase as miners go deeper into the earth, but there is also the heat generated by oxidation of various minerals, frictional heat of machinery, explosives, and the heat given off by miners working in such confined places.

Another source is the heat of adiabatic compression of the air which is forced down into the mine by the ventilating system. Pumped more than a mile down into the mine from the

surface, ventilating air is gradually compressed until at the bottom considerable heat has been generated by compression, and released into the mine workings.

Humidities are high due to seepage of water into the mines, and from the mandatory practice of settling dust by wetting down the mine surfaces during drilling and after blasting.

## New Air Circulator Developed by G-E

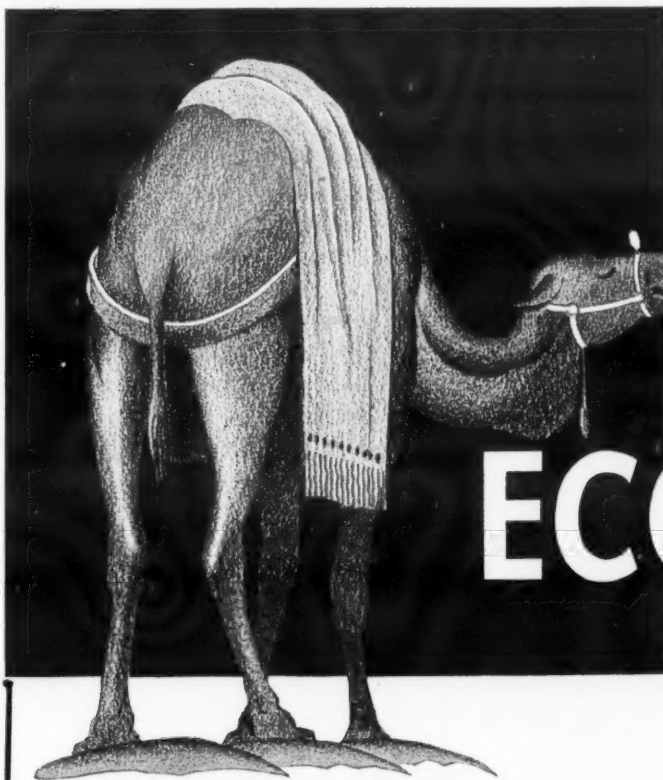
SCHENECTADY—An improved air circulator, consisting of a motor mounted on a resilient base and a directly connected aphonous pressure-type propeller fan with orifice and assembled in a sturdy cabinet finished in durable gray with nickel trim, is now available from the General Electric air-conditioning department.

The air circulator has a variety of applications. When installed in the attics of homes, its function is to produce more comfortable conditions during hot summer weather in the following two ways:

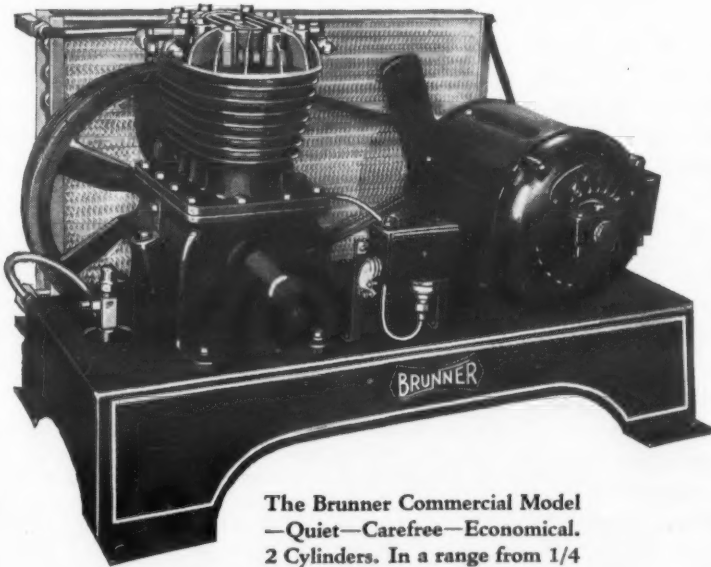
First, by producing a forced circulation of air through the attic during the day, the heat leakage into living quarters because of the hot sun effect on the roof is substantially eliminated.

Second, by drawing the relatively cool outside air through the living quarters toward the end of the day and during the evening when the outdoor temperature is lower than that indoors, the heat stored in the house is effectively removed.

The air circulator may be set in front of an attic window and plugged into the nearest electric outlet, or it may be permanently installed with duct connection to the outside and with suitable electric wiring, time switch, and other accessories.



Rivalling  
the Camel's  
**ECONOMY**



The Brunner Commercial Model—Quiet—Carefree—Economical. 2 Cylinders. In a range from 1/4 H. P. to 2 H. P.

● Brunner refrigeration units have the happy faculty of asking little and giving much. Skill in designing and constructing Brunner Compressors and Highsides have produced an eminent degree of operating economy... to the extent that probably no competing units today can offer so much effective refrigeration at so consistently as low a rate as Brunner. This is no idle hope! It is a practicality. Abundant evidence is offered by the scores of Brunner installations now being completed on the basis of comparative tests... now, more than ever, Brunner is "The Fastest Growing Name in the Industry". There's a Brunner unit to solve present problems: eight models of compressors, 41 models of highsides from 1/6 H. P. to 15 H. P. New catalog packed with useful facts. Free! Write: Brunner Manufacturing Co., Utica, N. Y., U. S. A.

**Brunner**

A NAME BUILT BY 29 YEARS OF SERVICE



## ELECTRIC REFRIGERATION NEWS

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VOL. 15, No. 6, SERIAL NO. 324, JUNE 5, 1935

## Refrigeration Industry Can Regulate Itself

TELEGRAMS from leading executives of the electric refrigeration industry received by the editor of the NEWS since the Supreme Court of the United States declared the NRA unconstitutional clearly show that this industry, for one, believes that it can progress better, farther, and faster under its own supervision than underneath the hampering yoke of government regulation. Almost to a man these executives declare that they are firmly opposed to any alteration of the Constitution to permit legal extension of the NRA plan, that the good features of the idea can be preserved better by the industry itself than by some government bureau, and that the refrigeration business should benefit from the Supreme Court's magnificent reaffirmation of the fundamental principles underlying our form of government.

Like Marc Anthony in his oration over the dead body of Julius Caesar, this issue of ELECTRIC REFRIGERATION NEWS comes to bury the NRA, not to praise it. When the Blue Eagle first flapped its wings the Business News Publishing Co. joined the party by agreeing to the provisions of the publishers' code. Right at the outset a Blue Eagle issue of the NEWS appeared. But as soon as the full implications—and complications—of the idea became clear, ELECTRIC REFRIGERATION NEWS took a decided stand against the NRA, a stand which it has consistently adhered to ever since. All along the NEWS has believed it was voicing the sentiment of the industry it represented by pointing out that refrigeration had amply demonstrated it could take care of itself, and did not need a bureaucracy down in Washington to lead it by the hand. The telegrams printed in this issue would seem to confirm that presumption.

### NRA Was 'Out on Its Feet'

The economic fallacies of this monstrous attempt to regulate the vastly complicated pattern of the nation's business soon became apparent to serious thinkers. And during the drawing up of the various codes, the unfathomable complexity and magnitude of the task completely bewildered, befogged, and discouraged almost everyone concerned with the abortive efforts to codify and correlate the intricate forces and counterforces of industry. It was when it came to enforcement, though, that the NRA really bogged down. As General Johnson himself put it, the NRA was "dead as a dodo" before the unanimous Supreme Court decision cut off its neck sharply, cleanly, and with utter finality.

That President Roosevelt should take the well-considered judgment of the court with such bad grace seems deplorable. His heated and ill-advised remarks in his first press conference after the decision—in which he suggested that our form of government might be altered to permit the control of private industry by politicians—made it exceedingly plain that the

Administration still harbors delusions that the President's famed personal magnetism could yet hypnotize the country into sanctioning some form of dictatorship.

### What Executives Believe

As Harvey Lindsay, president of Dry-Zero Corp., puts it: "Any permanent NRA will merely transfer business and industrial initiative and responsibilities from business executives to the growing horde of political appointees. I do not think the record of the latter over the past 20 years compares favorably with the record of the former in the matter of abuses and personal aims."

"We strongly resent governmental meddling by theorists, demagogues, and politicians," asserts Albert Penn of the Penn Electric Switch Co. "The recent Supreme Court decisions, we believe, will go down in history as some of the most momentous decisions ever rendered by this court." Edwin H. Arnold of Liberty Refrigeration Corp. shows that his company is not misnamed when he declares that he is "bitterly opposed to any change in the Constitution to enable continuance of the NRA in any form." President C. U. Williams of Williams Oil-O-Matic agrees, saying: "This organization is satisfied to stay with the Constitution, and feels no need whatever of NRA being continued. We think business will advance rapidly if left to regulate itself."

The veteran E. E. McCray, president of the McCray Refrigerator Co. and perhaps the oldest head of all refrigeration executives, wires: "Our industry can best solve its own problems without government interference or regulation." H. V. Higley of Ansul Chemical Co. insists that "wholesale government regulation of business is always destined to failure." Similar sentiment comes from C. T. Bappler of the Bush Mfg. Co., who says: "We are decidedly not in favor of Constitutional changes that would make permanent regulations governing business."

And T. Irving Potter, president of the Potter Refrigerator Corp., avers: "To change the Constitution in order to perpetuate the scheme of building a gigantic bureaucracy for the government of the American people would constitute one of the big crimes of history. I may be called old-fashioned, but I still ardently believe that the spirit and principles which lifted the American people to the status of a great nation can be depended upon to carry us through any temporary setbacks."

### Administration Should Heed

These executives live in widely divergent points scattered all over the country, run diverse types of businesses (even if all do have some relation to refrigeration), are of varying ages and backgrounds, represent both large and small concerns, and not infrequently disagree violently. Yet they are in complete harmony on this question, and their attitude should be considered long and seriously by the Administration before it damns itself utterly with any foolish moves toward dictatorship or fascism in violation of the Court's clear opinion that it has already exceeded its authority.

Perhaps one of the best commentaries on the Administration's present policy was uttered by Franklin D. Roosevelt, himself, when he was governor of New York. In a speech broadcast over a national radio hook-up March 2, 1930, Roosevelt said:

"The doctrine of regulation and legislation by 'master minds' in whose judgment and will all the people may gladly and quietly acquiesce, has been too glaringly apparent at Washington during these last 10 years. Were it possible to find 'master minds' so unselfish, so willing to decide unhesitatingly against their own personal interests or private prejudices; men almost godlike in their ability to hold the scales of justice with an even hand—such a government might be to the interests of the country, but there are none such on our political horizon and we cannot expect complete reversal of all teachings of history."

And right there is the answer to those who would extend the Federal government's powers. Even if "men almost godlike in their ability to hold the scales of justice with an even hand" were available—and could be elected to public office—it does not seem probable that the nation's supply of "master minds" would be equal to the task of administering a central control of all the nation's business.

## LETTERS

### Write Your Congressman

San Benito, Texas

Editor:

Some time ago we subscribed to the ELECTRIC REFRIGERATION NEWS and began receiving it promptly until late Sunday evening. After approximately three weeks of that and Monday morning saw the NEWS in the Post Office then late Monday evening. Since then it wanders in anywhere from Monday morning to Tuesday evening. This week it has failed to arrive at all.

Is there any way we can depend on it arriving before Tuesday morning. As it is the only dependable refrigeration news we can receive it would be very gratifying if we knew just when it should arrive.

A. E. MEAD.

Answer: Our files show that we have your correct address on our records and that a copy of the NEWS is mailed to you regularly every Wednesday afternoon. The delay in receiving your copies of the NEWS is evidently due to postal service.

### Regarding the 'Fiesta'

The American Society of Refrigerating Engineers  
37 West 39th St., New York City

Dear Mr. Cockrell:

At meeting of our council held immediately after our sessions at Detroit last week, I have been directed to write you to express the Society's appreciation for the part which you played in making our stay at Detroit so enjoyable and interesting.

We all realize how much time, effort, and money a party such as you put on for us entailed. We all had a splendid time. The affair will be long remembered by all of us.

H. HARRISON,  
President.

Merchant & Evans Co.  
2035 Washington Ave., Philadelphia

Editor:

I would like to congratulate you on the beautiful building and layout of your new home for the ELECTRIC REFRIGERATION NEWS. It is, without a doubt, the most up-to-date and best furnished publishing house of its size in the country and your desire to modernize this building with air conditioning even in its experimental state, is certainly most gratifying, and above all, I would like to thank you very much for the many courtesies shown to me and for the delightful entertainment that you gave to the engineers.

S. J. BENN,  
Chief Refrig. Engineer.

2615 Twelfth St., Detroit, Mich.

Dear Mr. Cockrell:

I want to thank you again for the wonderful evening you gave the A.S.R.E. Certainly it must have exceeded your expectations. Everyone who attended has voted it one of the most successful parties ever given, and you have every cause to congratulate yourself and your organization. You are the top.

ELIZABETH BRIGHT.

The American Society of Refrigerating Engineers  
37 West 39th St., New York City  
May 28, 1935.

Dear Mr. Taubeneck:

I expressed my gratitude to you people rather inadequately in talking to Mr. Cockrell last Friday. He will hear further from our group to say how very much we are in your debt for the swell time we all had last Wednesday night. I think it is about the finest party we ever had.

I want to say also that I was extremely interested in your establishment which is certainly unique and which deserves more celebration than we can give it.

I hope you found that the thing was worthwhile from your point of view to repay you for all your effort and expense, but I believe you will find the reward coming back to you for a long time in the form of goodwill.

DAVID L. FISKE,  
Executive Secretary.

E. I. Du Pont de Nemours & Co., Inc.  
The R. & H. Chemicals Dept.  
Sales Division  
Wilmington, Dela.

My dear Frank:

A long time back, you and your staff established a reputation for turning out a good newspaper, but I must say that you have now added to that reputation also one of being a good host.

We certainly had a very enjoyable occasion at the Fiesta on the 22nd and I can assure you that I enjoyed every minute of it. I know that I am not alone in saying this as I have

heard a great deal of very favorable comment from others.

I pass this along to you as favorable comment, because I think we are prone to overlook any opportunity to pass along favorable comment and seize upon opportunities to pass comment not so favorable when the occasion arises.

THOMAS COYLE.

Refrigerating Engineering  
The American Society of  
Refrigerating Engineers

37 West 39th St., New York City

Dear George:

We have been conferring since we got into the office this morning on how splendidly the Detroit Convention was arranged and what a good time we all had. Of course, the high spot was your party at ELECTRIC REFRIGERATION NEWS, which was a delightful affair in every detail.

HELEN H. PEPPER,  
Managing Editor.

York Ice Machinery Corp.  
York, Pa.

May 29, 1935.

Dear Mr. Cockrell:

This is just to tell you that we all enjoyed the "Refrigeration Fiesta" immensely last Wednesday night, and that the Detroit A.S.R.E. Convention Committees are to be highly complimented on the fine meetings and entertainment they provided.

JOHN T. SCHAEFER,  
Sales Promotion Division.

Keeney Publishing Co.

6 N. Michigan Ave., Chicago

Dear Mr. Cockrell:

I wish to take this opportunity of congratulating you and your staff on the very splendid party that you gave in connection with the A.S.R.E. meeting, and especially wish to thank you for the courtesies extended me.

R. PAYNE WETSTEIN,  
Secretary.

Fedders Mfg. Co., Inc.

Buffalo, N. Y.

Dear Mr. Cockrell:

I wish to offer my sincere thanks for the splendid time the writer enjoyed Wednesday, May 22. Your hospitality was indeed appreciated and I wish to compliment you on the wonderful plant which you have.

H. E. RIECKELMAN,  
Assistant to the President  
In Charge of Sales.

Western Union

Chicago, Ill.

Congratulations and best wishes for continued success in your new home.

S. NIDES,  
R. Cooper Jr., Inc.

1144 Lakepointe Ave.

Grosse Pointe Park, Mich.

Dear Frank:

I sure will attend your fiesta—And feel honored to be your dam guest!

But after—I'll need a long resta! Which in Spanish is called a Siesta! At least I think it's called a "Siesta"; but refer to your comprehensive Data Book—it tells everything from refrigeration to bunions!

GORDON MUIR.

### World's Fair Controversy

2015 Chester Ave.  
Bakersfield, Calif.

Editor:

Was it in your magazine that we saw the article denying that the Norge Refrigeration Co. won the prize at the World's Fair and that they should not use that information in their sales arguments?

H. S. BAKER.

Answer: We believe you have reference to the wrong refrigeration company in the matter of a dispute over the prize given at the World's Fair.

The controversy arose over the fact that the General Household Utilities Co. (manufacturer of the Grunow electric refrigerator) made capital of the fact that their refrigeration unit was the only one on exhibit in the Hall of Science during the first year of the Fair. A story dealing with the controversy that arose was published on page 11 of the July 26, 1933, issue of ELECTRIC REFRIGERATION NEWS.

### Salesmen Should Know—

Hotel Governor  
San Francisco, Calif.

Editor:

Would you kindly mail me a copy of your paper, the March 20 issue? I would especially want that issue as it contains the specifications of many makes of electric refrigerators.

I am only a salesman with the Redlick-Newman Co. of this city, but I feel that the one issue of your paper, above mentioned, is worth many dollars to any one selling refrigeration. A salesman should know as much as possible regarding all competitive makes, and I believe the March 20 issue of your paper will help me a great deal.

Enclosed please find 10 cents for same.

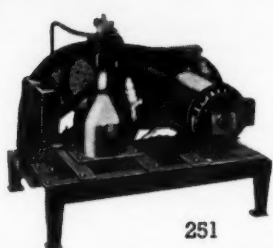
R. H. NEWHALL.



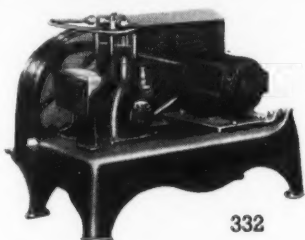
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**ASSURE  
GREATER  
SATISFACTION  
AND  
LONGER  
SERVICE**

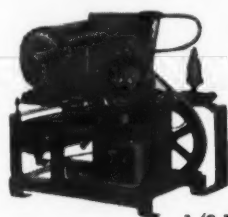
# Condensing Units



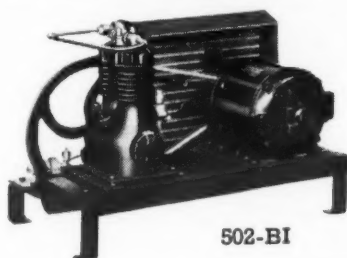
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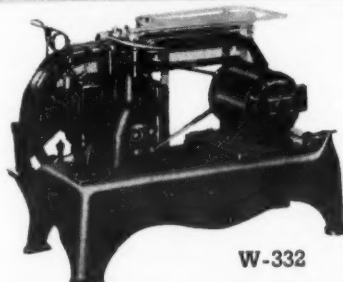
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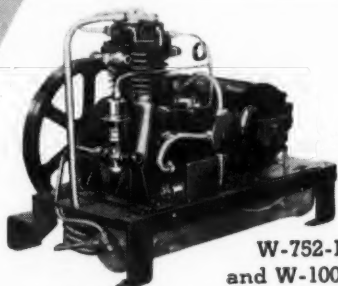
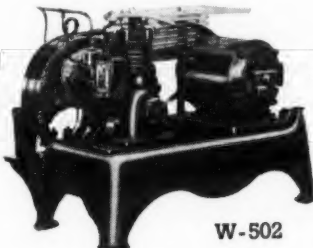
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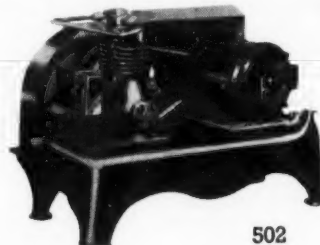
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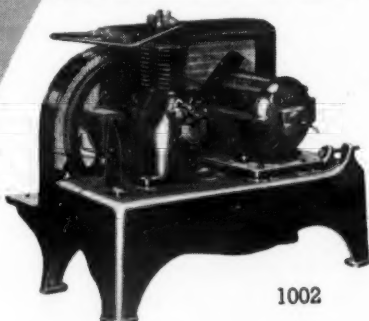
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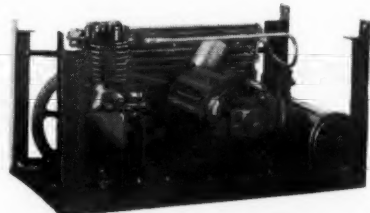
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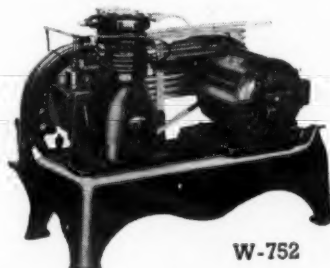
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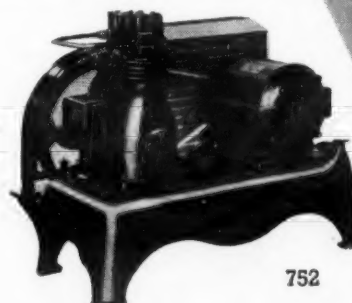
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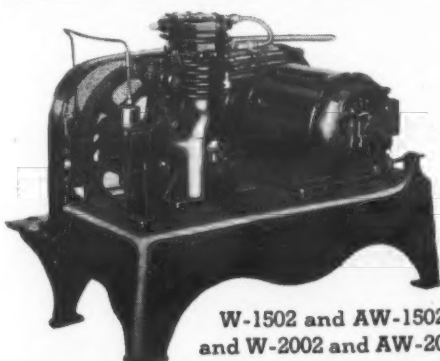
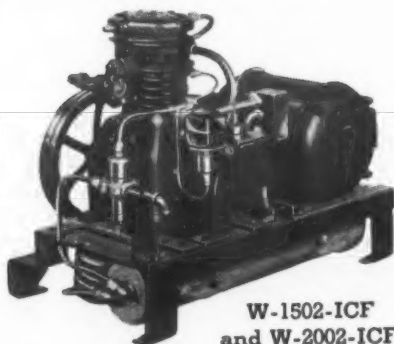
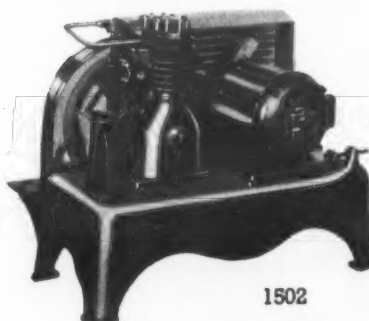
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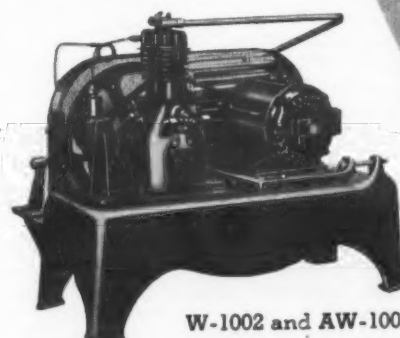
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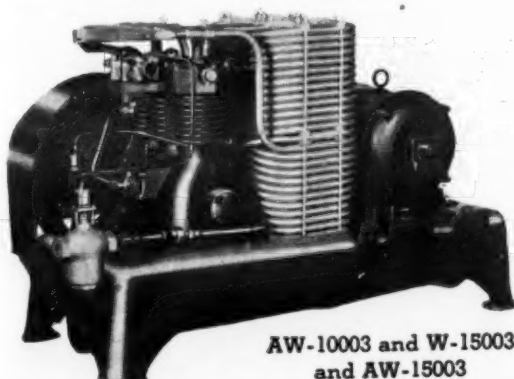
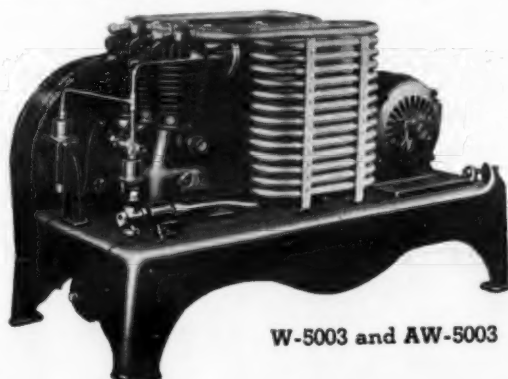
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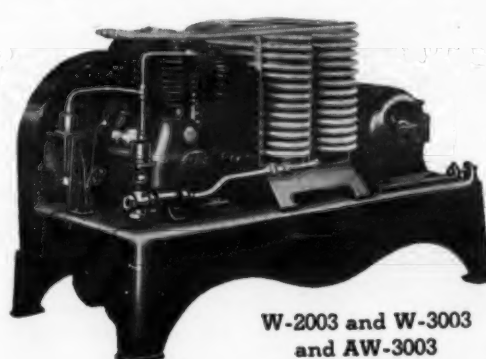
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and AW-15003

W-5003 and AW-5003

W-2003 and W-3003  
and AW-3003

2002

for  
Air Conditioning  
Ice Cream Cabinets  
Ice Cream Freezers  
Truck Refrigeration  
Display Counters  
Store Fixtures  
Milk, Water and  
Beverage Cooling  
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DETROIT, MICHIGAN

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TWELVE YEARS OF LEADERSHIP IN SUPPLYING COMMERCIAL REFRIGERATION TO THE TRADE



## STATISTICS

### 14 Manufacturers Sell 256,559 Household Units in April, 1935

The following 14 member companies of the Refrigeration Division of the National Electrical Manufacturers Association (Nema) reported sales for April, 1935, and household inventories for March:

Apex Elec. & Mfg. Co., Crosley Radio Corp., Frigidaire Corp., General Electric Co., Gibson Electric Refrigerator Corp., Kelvinator Corp., Leonard Refrigerator Co., Norge Corp., Servel, Inc., Stewart-Warner Corp., Sunbeam Electric Mfg. Co., Uniflow Mfg. Co., Universal Cooler Corp., and Westinghouse Electric & Mfg. Co. Member companies not reporting included: Jomoco, Inc., Merchant & Evans Co., and Sparks-Withington Co. The sales of the reporting companies do, however, include units manufactured for the following concerns: Major Appliance Corp., Montgomery Ward & Co., Potter Refrigerator Corp., Sears, Roebuck & Co., and Truscon Steel Co.

HOUSEHOLD Lacquer (Exterior) Cabinets Complete	SALES FOR APRIL, 1935				Other Foreign Quantity Value	
	Domestic Quantity	Domestic Value	Canadian Quantity	Canadian Value		
1. Chest	5,364	\$ 269,078	238	\$ 10,557	870	\$ 44,488
2. Less than 3.00 cu. ft.	150	8,017	...	...	122	6,380
3. 3 to 3.99 cu. ft.	9,777	556,394	...	...	1,539	86,952
4. 4 to 4.99 cu. ft.	54,660	3,579,461	1,000	69,657	4,174	270,815
5. 5 to 5.99 cu. ft.	57,283	4,451,680	436	33,389	1,045	82,164
6. 6 to 6.99 cu. ft.	34,420	3,089,219	231	20,774	917	82,348
7. 7 to 7.99 cu. ft.	15,961	1,700,201	339	37,978	204	22,340
8. 8 to 8.99 cu. ft.	3,463	388,537	46	5,064	102	11,767
9. 9 to 9.99 cu. ft.	28	5,608	...	...	1	338
10. 10 to 12.99 cu. ft.	6	1,669	...	...	1	281
11. 13 cu. ft. and up	181,112	14,049,864	2,290	177,419	8,975	607,873
11. Total Lacquer	211,164	17,329,146	2,628	214,970	10,234	765,651
Porcelain (Exterior) Cabinets Complete	...	...	...	...	...	...
12. Up to 4.99 cu. ft.	2,387	181,022	60	5,820	79	6,209
13. 5 to 5.99 cu. ft.	7,791	690,191	150	13,994	384	35,619
14. 6 to 6.99 cu. ft.	9,287	982,387	20	2,331	192	20,168
15. 7 to 7.99 cu. ft.	7,199	883,161	73	9,967	302	37,155
16. 8 to 8.99 cu. ft.	2,498	365,252	27	3,515	202	28,584
17. 9 to 9.99 cu. ft.	636	116,228	6	1,463	105	18,157
18. 10 to 12.99 cu. ft.	254	61,041	2	461	55	11,886
19. 13 cu. ft. and up	30,052	3,279,282	338	37,551	1,319	157,778
19. Total Porcelain	41,970	4,864,548	548	62,091	2,235	282,626
20. Total—Lines 11 and 19	253,134	22,193,694	3,176	277,060	12,469	1,048,277
21. Separate Systems 1/4 Hp. or Less	31,324	1,147,617	...	...	404	19,000
22. Separate Household Evaporators	419	7,404	40	361	286	4,893
23. Total—Lines 20, 21, 22	31,743	1,155,021	44	397	790	23,893
24. Condensing Units 1/4 Hp. or Less	538	30,951	45	2,642	858	52,148
25. Cabinets—No Systems	470	14,144	...	...	481	16,636
26. Total Household	315,857	\$18,529,262	3,668	\$217,973	14,352	\$858,328

### 523,598 Household Units Held in Stock On March 30, 1935, 14 Companies Report

HOUSEHOLD Lacquer (Exterior) Cabinets with Systems	U. S. A. INVENTORIES for March, 1935				Distributors Quantity Value	
	Factory Quantity	Branch & Warehouse Value	Quantity	Value		
1. Chest	45,394	\$ 2,289,097	2,419	\$ 119,740	...	...
2. Less than 3.00 cubic feet	456	28,320	941	54,548	...	...
3. 3 to 3.99 cubic feet	10,305	562,281	3,199	182,975	...	...
4. 4 to 4.99 cubic feet	80,445	5,065,857	21,812	1,416,235	...	...
5. 5 to 5.99 cubic feet	73,052	5,833,946	19,605	1,536,868	...	...
6. 6 to 6.99 cubic feet	40,574	3,687,364	15,167	1,384,647	...	...
7. 7 to 7.99 cubic feet	46,212	5,144,954	10,607	1,148,361	...	...
8. 8 to 8.99 cubic feet	5,123	591,189	1,373	164,602	...	...
9. 9 to 9.99 cubic feet	878	154,313	91	17,294	...	...
10. 10 to 12.99 cubic feet	119	31,658	51	8,807	...	...
11. 13 cubic feet and up	302,686	\$23,425,912	85,348	\$6,808,451	...	...
11. Total Lacquer	491,706	\$28,573,371	111,070	\$9,783,435	...	...
Porcelain (Exterior) Cabinets Complete	...	...	...	...	...	...
12. Up to 4.99 cubic feet	6,919	544,718	1,093	84,980	...	...
13. 5 to 5.99 cubic feet	5,454	501,216	4,635	430,475	...	...
14. 6 to 6.99 cubic feet	3,533	362,213	3,199	542,555	...	...
15. 7 to 7.99 cubic feet	15,579	1,983,056	4,426	562,091	...	...
16. 8 to 8.99 cubic feet	7,509	1,159,081	2,088	310,999	...	...
17. 9 to 9.99 cubic feet	1,191	217,546	486	92,120	...	...
18. 10 to 12.99 cubic feet	1,492	368,003	325	79,022	...	...
19. 13 cubic feet and up	41,706	\$5,147,459	25,722	\$2,974,984	...	...
19. Total Porcelain	64,125	\$7,405,811	31,343	\$3,787,696	...	...
20. Total—Lines 11 and 19	555,831	\$36,029,182	142,413	\$13,571,131	...	...
21. Separate Systems 1/4 Hp. or Less	55,955	2,708,432	...	...	...	...
22. Separate Household Evaporators	11,961	162,665	220	4,864	...	...
23. Total—Lines 20, 21, and 22	67,916	\$2,871,117	220	\$4,868	...	...
24. Condensing Units 1/4 Hp. or Less	3,118	193,082	276	16,019	...	...
25. Cabinets—No Systems	97,491	3,212,561	38	3,592	...	...
26. Total Household	623,346	\$39,045,111	142,713	\$13,589,910	...	...

\*These totals are not the sum of the breakdown figures as two companies did not report on individual items.

### Field Stocks Increase in April, Report Of 14 Manufacturers Shows

HOUSEHOLD Lacquer (Exterior) Cabinets Complete	U. S. A. INVENTORIES				Distributor Quantity Value	
	Factory Quantity	Branch & Warehouse Value	Quantity	Value		
1. Chest	6,472	\$ 324,123	39,350	\$ 1,982,907	2,339	\$ 116,073
2. Less than 3.00 cu. ft.	272	14,397	391	23,865	162	9,116
3. 3 to 3.99 cu. ft.	11,316	643,946	11,205	643,164	3,627	207,383
4. 4 to 4.99 cu. ft.	59,834	3,919,933	55,729	5,568,164	19,672	1,267,067
5. 5 to 5.99 cu. ft.	58,764	4,567,233	68,103	5,421,256	21,443	1,691,052
6. 6 to 6.99 cu. ft.	35,568	3,192,341	43,526	4,077,467	15,211	1,409,975
7. 7 to 7.99 cu. ft.	16,504	1,760,519	38,459	4,297,278	12,081	1,298,603
8. 8 to 8.99 cu. ft.	3,611	405,368	3,952	456,663	1,503	180,089
9. 9 to 9.99 cu. ft.	29	5,946	846	153,811	102	18,843
10. 10 to 12.99 cu. ft.	7	1,950	112	29,840	34	8,891
11. 13 cu. ft. and up	192,377	14,835,156	291,720	\$22,658,775	88,672	\$7,763,189
11. Total Lacquer	315,857	\$18,529,262	3,668	\$217,973	14,352	\$858,328
Porcelain (Exterior) Cabinets Complete	...	...	...	...	...	...
12. Up to 4.99 cu. ft.	2,526	193,051	7,019	551,359	1,053	81,942
13. 5 to 5.99 cu. ft.	5,325	739,804	6,225	567,581	6,475	595,155
14. 6 to 6.99 cu. ft.	9,499	1,004,886	4,564	475,891	5,129	561,872
15. 7 to 7.99 cu. ft.	7,574	930,283	13,976	1,773,638	4,450	567,074
16. 8 to 8.99 cu. ft.	2,727	397,351	8,545	1,340,376	2,359	350,896
17. 9 to 9.99 cu. ft.	747	135,848	1,538	294,912	526	101,361
18. 10 to 12.99 cu. ft.	311	73,388	1,711	398,254	357	87,018
19. 13 cu. ft. and up	31,709	3,474,611	43,885	\$5,403,788	30,215	\$3,469,055
19. Total Porcelain	33,230	\$3,608,592	55,604	\$7,078,660	10,360	\$1,248,811
20. Total—Lines 11 and 19	349,087	\$22,137,854	4,222	\$28,856,633	24,712	\$9,817,139
21. Separate Systems 1/4 Hp. or Less	31,728	1,166,617	15,254	858,857	...	...
22. Separate Household Evaporators	745	12,658	2,291	48,042	187	4,338
23. Total Lines 20, 21 & 22	33,473	\$1,179,275	17,545	\$907,904	...	...
24. Condensing Units 1/4 Hp. or Less	1,441	85,741	2,803	169,644	225	13,124
25. Cabinets—No Systems	951	30,780	25,915	873,224	40	3,807
26. Total Household	382,560	\$23,317,129	4,239	\$29,764,537	24,937	\$10,065,513

\*These totals are not the sum of the breakdown figures as two companies did not report on individual items. Note: One company did not supply figures on Factory, Branch, and Warehouse Inventories. Seven companies did not supply figures on Distributor Inventories.

### Industry Sales Hit New Peak in April

(Concluded from Page 1, Column 5)

hold electric refrigerators were sold in the United States alone during the three-month period.

April shipments by members of the Household Refrigeration Section of the National Electrical Manufacturers Association (Nema) numbered 256,559 refrigerators bringing the four-months total to 674,978. Members reporting were Apex, Crosley, Frigidaire, General Electric, Gibson, Kelvinator, Leonard, Norge, Servel, Stewart-Warner, Sunbeam, Uniflow, Universal Cooler, and Westinghouse. Reports are not included for Jomoco, Merchant & Evans, and Sparks-Withington. The Nema figures include refrigeration units manufactured by members for Fairbanks-Morse, Major, Montgomery Ward, Potter (Nema member), Sears, Roebuck, and Truscon.

Reports compiled for the first three months by the Commercial Refrigeration Section of Nema were not released at the same time as those covering household equipment, but preliminary bulletins covering this period have recently been made available. Under an agreement made effective during the early part of 1935, the Commercial Section has included sales of several non-members in the commercial bulletins.

The reports cover sales of all fractional horsepower equipment and represent the activities of 17 manufacturers of commercial refrigeration equipment. Sales of refrigeration units of above 1 horsepower and over by industry manufacturers are reported to the Refrigerating Machinery Association.

Companies whose figures are included in the Nema commercial section report are Baker Ice Machine Co., Brunner Mfg. Co., Carbondale Machine Corp., Carrier Engineering Corp., Crosley Radio Corp., Frigidaire Corp., General Electric Co., Gibson Electric Refrigerator Corp., Kelvinator Corp., Leonard Refrigerator Co., Norge Corp., Phoenix Ice Machine Co., Servel, Inc., Uniflow Mfg. Co., Universal Cooler Corp., Westinghouse Electric & Mfg. Co., and York Ice Machinery Corp. Condensing units for all applications shipped by reporting companies during January numbered 4,418. February sales totaled 7,732 units and 11,162 were shipped during March. The changed personnel of the reporting group since last year makes it impossible to compare 1935 sales with 1934 monthly figures reported by Nema.

Nema commercial reports for January, February, and March will be found in columns 4 and 5 of this page and the household refrigeration sales report for April is shown in columns 1 and 2.

### New York Regains Lead in Sales by States

The following report shows distribution of sales of Nema companies for April.

States and Territories	Quantity of Household Low Sides
Alabama	5,234
Arizona	1,374
Arkansas	1,909
California	12,205
Colorado	1,591
Connecticut	3,761
Delaware	560
District of Columbia	1,741
Florida	3,385
Georgia	4,597
Idaho	1,054
Illinois	23,293
Indiana	6,013
Iowa	4,105
Kansas	3,549
Kentucky	3,335
Louisiana	2,883
Maine	1,204
Maryland	3,822
Massachusetts	8,615
Michigan	10,012
Minnesota	4,269
Mississippi	1,683
Missouri	7,732
Montana	971
Nebraska	3,074
Nevada	187
New Hampshire	862
New Jersey	9,376
New Mexico	821
New York	24,255
North Carolina	6,097
North Dakota	680
Ohio	17,707
Oklahoma	3,512
Oregon	1,394
Pennsylvania	16,799
Rhode Island	1,190
South Carolina	3,027
South Dakota	862
Tennessee	5,552
Texas	13,760
Utah	1,335
Vermont	504
Virginia	3,451
Washington	1,982
West Virginia	2,463
Wisconsin	4,778
Wyoming	342
Total United States	242,907
Canada	2,668
Other Foreign (Including U. S. Possessions)	10,984
Total for World	256,559

### Commercial Sales of 17 Companies

Commercial sales and inventories for January, February, and March, 1935, were reported to the National Electrical Manufacturers Association (Nema) by 17 companies, some of which are not members of the association. These reports cover the sale of units less than 1 hp. in size. Companies reporting are: Baker Ice Machine Co., Brunner Mfg. Co., Carbon-

dale Machine Corp., Carrier Engineering Corp., Crosley Radio Corp., Frigidaire Corp., General Electric Co., Gibson Electric Refrigerator Corp., Kelvinator Corp., Leonard Refrigerator Co., Norge Corp., Phoenix Ice Machine Co., Servel, Inc., Uniflow Mfg. Co., Universal Cooler Corp., Westinghouse Electric & Mfg. Co., and York Ice Machinery Corp.

COMMERCIAL	Domestic		JANUARY SALES		Other Foreign	
	Quantity	Value	Quantity	Value	Quantity	Value
1. Water Coolers Complete..	585	\$ 54,594	1	\$ 98	78	\$ 8,808
2. Water Coolers Remote....	25	1,376	....	....	....	....
3. Ice Cream Cabinets Complete .....	60	9,124	35	3,500	23	3,243
4. Ice Cream Cabinets Remote .....	84	12,227	....	....	14	1,867
5. Beverage Coolers Comp...	249	18,684	....	....	8	515
6. Beverage Coolers Remote.	110	7,130	....	....	17	1,084
Condensing Units						
7. Less than 1/4 Hp.....	119	6,685	....	....	129	8,930
8. 1/4 to 1/2 Hp. Inclusive....	1,553	116,510	14	1,131	638	55,925
9. Above 1/2 and less than 1 Hp.....	622	79,064	3	383	301	15,781
10. Total Lines 7, 8, and 9....	2,294	....	17	1,068	....	....
11. Total Lines 1, 3, 5, 10....	3,188	....	53	....	1,177	....
12. Evaporators .....	2,405	66,262	38	1,376	1,585	34,048
13. Miscellaneous Cases and Cabinets .....	13	3,770	2	100	1	193
14. Total Commercial .....	....	\$375,426	....	\$6,588	....	\$130,194
FEBRUARY SALES						
COMMERCIAL	Domestic	Canadian	Other Foreign	Domestic	Canadian	Other Foreign
	Quantity	Value	Quantity	Value	Quantity	Value
1. Water Coolers Complete..	575	\$ 59,087	3	\$ 318	99	\$ 10,028
2. Water Coolers Remote....	55	2,900	....	....	1	61
3. Ice Cream Cabinets Complete .....	714	115,271	33	3,395	57	8,227
4. Ice Cream Cabinets Remote .....	305	41,780	3	396	43	4,813
5. Beverage Coolers Comp...	848	68,111	2	128	3	187
6. Beverage Coolers Remote.	182	12,973	....	....	....	....
Condensing Units						
7. Less than 1/4 Hp.....	460	25,565	....	....	173	10,399
8. 1/4 to 1/2 Hp. Inclusive....	2,365	207,029	35	3,296	1,442	126,745
9. Above 1/2 and less than 1 Hp.....	723	97,924	18	2,531	182	23,853
10. Total Lines 7, 8, and 9....	3,548	....	53	....	1,797	....
11. Total Lines 1, 3, 5, 10....	5,685	....	91	....	1,956	....
12. Evaporators .....	2,817	86,430	104	4,440	639	19,929
13. Miscellaneous Cases and Cabinets .....	17	3,274	2	125	2	589
14. Total Commercial .....	....	\$720,344	....	\$14,629	....	\$204,831
MARCH SALES						
COMMERCIAL	Domestic	Canadian	Other Foreign	Domestic	Canadian	Other Foreign
	Quantity	Value	Quantity	Value	Quantity	Value
1. Water Coolers Complete..	1,067	\$108,269	2	\$ 188	34	\$ 3,793
2. Water Coolers Remote....	54	2,875	....	....	2	138
3. Ice Cream Cabinets Complete .....	808	127,385	122	16,704	88	13,262
4. Ice Cream Cabinets Remote .....	490	64,077	13	1,630	52	6,738
5. Beverage Coolers Comp...	2,955	230,566	6	390	25	1,903
6. Beverage Coolers Remote.	127	12,124	....	....	31	1,926
Condensing Units						
7. Less than 1/4 Hp.....	481	29,697	2	136	306	19,426
8. 1/4 to 1/2 Hp. Inclusive....	3,087	207,253	51	7,212	1,086	82,626
9. Above 1/2 and less than 1 Hp.....	732	107,467	27	3,537	253	34,269
10. Total Lines 7, 8, and 9....	4,300	....	110	....	1,645	....
11. Total Lines 1, 3, 5, 10....	9,130	....	240	....	1,792	....
12. Evaporators .....	4,178	122,525	207	7,485	895	29,293
13. Miscellaneous Cases and Cabinets .....	17	3,579	8	1,050	19	5,277
14. Total Commercial .....	....	\$1,015,217	....	\$38,332	....	\$198,651



# ENGINEERING

## Rational Development & Rating Of Extended Cooling Surface Outlined by Pownall

DETROIT—New studies in the rational development and rating of extended air-cooling surface were described by H. B. Pownall, engineering department, York Ice Machinery Corp., at the spring meeting of the American Society of Refrigerating Engineers, held here May 22-25.

Mr. Pownall's paper described the procedure and tests followed in the development of an extended surface having specific requirements, together with a sample set of rating curves such as are required for the practical application of the final surface.

In starting the design of a surface, Mr. Pownall said, consideration must be given to the following features:

- (a) B.t.u./dollar (manufacturing cost).
- (b) B.t.u./ft.<sup>3</sup> of space occupied.
- (c) Moisture pick-up (dehumidifying capacity).
- (d) Frictional resistance to air flow.
- (e) B.t.u./lb. of coil weight.

"The first decision to be made," said Mr. Pownall, "is whether the final effort is to be towards the most work per ft.<sup>3</sup> of space occupied, or towards the most work for a given initial cost."

"Let us assume that in this case the face area per ton capacity of the coil is approximately determined by the size of production standards. The minimum ft.<sup>3</sup>/min. ton is limited by the largest temperature difference permissible for proper diffusion, while the maximum value is limited by fan horsepower, noise, duct sizes, etc. Thus, the face velocity will be held within rather definite limits."

"The depth of the coil will be determined by the efficiency of the surface selected, and by the ratio of the sensible cooling effect to the dehumidifying effect. Weight is always a big factor, hence the coil must be as light as practically possible. Another factor is that the air resistance through the coil should not be excessive."

"Having taken the above factors into consideration the problem in this particular case was that of designing a surface to approximate the following specifications, having at the same time a relatively low cost per ton of capacity:

Capacity  
Face velocity  
Air resistance  
Multiplier,  
Total heat cooling effect  
sensible cooling effect  
Refrigerant temperature  
Entering air  
Entering air

formula for extended surface because of the effect of temperature gradient through the fins. The writer has rewritten it to apply to extended surface as,

$$K = \frac{1}{R + \frac{1}{h_1 + \frac{1}{h_2 x}}}$$

Where K=B.t.u./ft.<sup>2</sup> external surface per degree mean temperature difference between air and the cooling medium, per hour.

Total external surface area

R= Inside tube area

$h_1$ =Inside film coefficient of cooling medium, B.t.u./hr./ft.<sup>2</sup> °F.

$h_2$ =Outside film coefficient of air, B.t.u./hr./ft.<sup>2</sup> °F.

$x$ =Fin efficiency=  
Av. air temp.—ave. fin temp.

Ave. air temp.—temp. of tube surface  
 $L$ =Tube wall thickness.

$k$ =Conductivity of tube material.

"It should be noted that in (2) the term  $L/k$  has been omitted, as it has been proved that this term is so small in air cooling, as compared with the other two terms, that it may be completely ignored with very little effect in the final result."

"The term  $R$  takes into account the difference between the area to which the external film coefficient applies and that to which the internal film coefficient applies.  $R$  as used in (2) will give a value for the overall heat transfer coefficient in terms of the total external surface area."

"It is practically impossible to compute any numerical value for the fin efficiency,  $x$ , for round or square fins not of uniform cross section, since it involves a very difficult integration due to the varying amounts of heat flowing out at different positions on the fin. However, McAdam gives the following formula for a bar fin of constant cross sectional area:

$$\text{Fin efficiency} = \frac{\tanh ab}{ab}$$

1.00 ton/ft.<sup>2</sup> of face area  
430 ft./min.  
0.3 in H<sub>2</sub>O maximum

1.40

40° F.  
80° F. dry bulb  
50 per cent relative humidity

### Fundamental Theory Necessary to Arrive at Final Design

"In order that a fair comparison could be made of all the possible combinations of design, it is necessary to find some means of estimating the performance of the most feasible designs without going through an endless amount of test work."

"It is a well known fact that the basic formula of heat transfer, namely,

$$K = \frac{1}{\frac{1}{h_1} + \frac{L}{k} + \frac{1}{h_2}}$$

holds for bare pipe surface. However, the papers heretofore presented have hesitated to advise the use of this

Where:

$a = (h_2 p / ks) 0.5$

$b$ =Height of fin from base to tip

$h_2$ =External film coefficient

$p$ =Exposed perimeter=21

$k$ =Conductivity of fin material

$S$ =Cross sectional area=1t

$\tanh$ =Hyperbolic tangent

"This formula does not hold for practical calculations since it is only true for the above case of a bar fin with uniform cross section. The closest thing to this type fin used in practice is the spiral fin which is wound from a ribbon, the inner part being corrugated to allow for the difference in diameter between the outer and inner edges of the fin."

"However, McAdam has shown the following variables are involved with

## Internal Film Coefficients

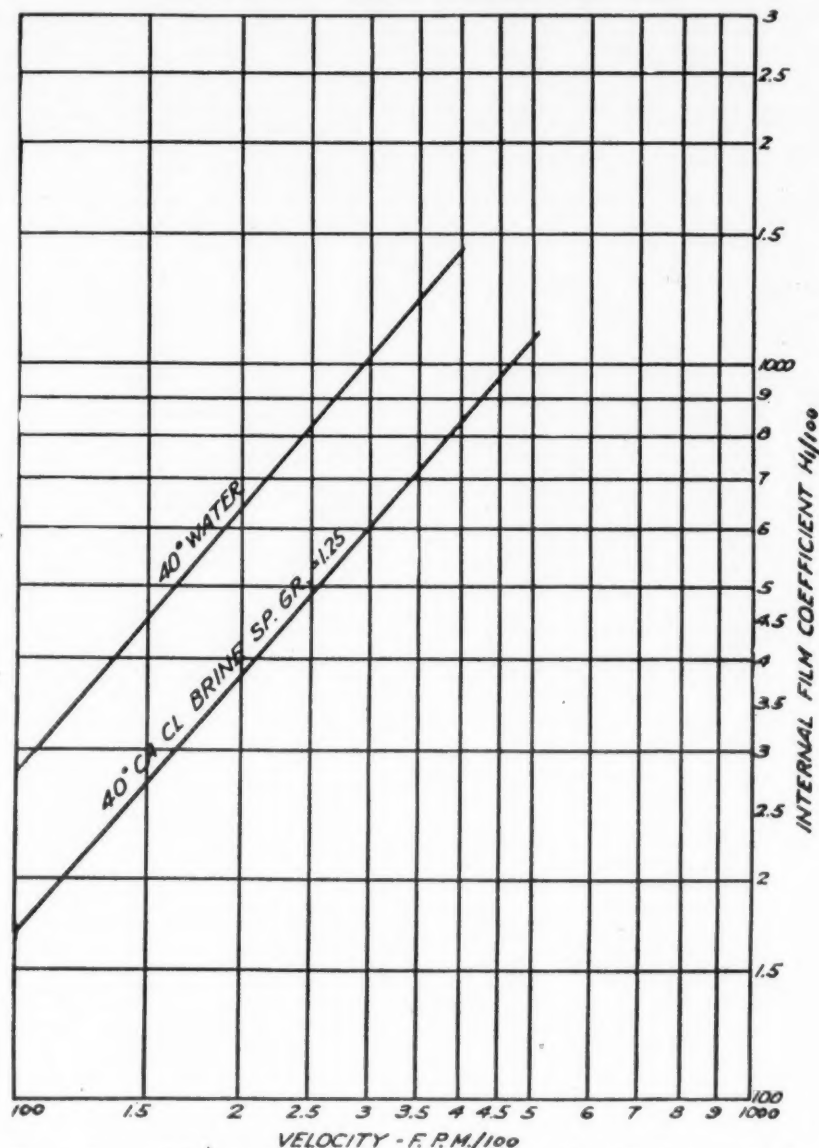


Fig. 1. Internal film coefficient of water and brine, 3/4 in. O. D. copper tube.

fin efficiency: First, the efficiency varies inversely as a function of the external film coefficient; second, it varies inversely as a function of the height of the fin; third, it varies directly as a function of the thickness and conductivity of the fin material; and fourth, it is constant regardless of the temperature difference between the fin and the air. Thus, for a given type of surface the only variable that affects the fin efficiency is the external film coefficient.

"Since  $x$  could not be determined alone, it was decided to solve for the quantity  $xh_2$  of equation (2). This could be done by performing sufficient test work to determine the overall nominal  $K$ , and then by knowing  $h_1$  the term  $xh_2$  could readily be calculated. The value  $h_1$  can be found for any non-volatile fluid and for this reason water and brine were chosen."

"Fig. 1 gives the internal film coefficients for 40° F. water and brine in a 3/4-in. O. D. copper tube for different velocities. These values were first determined from formulae given by McAdam and King."

"Tests were then made upon a finned coil with constant air velocity using both cooling mediums. The  $xh_2$  values were then computed using the theoretical  $h_1$  film coefficient. As has already been stated, the fin efficiency depends only upon the external film coefficient, and since in this case the external film coefficient depends only upon the air velocity, the  $xh_2$  values for these runs should remain constant."

"Therefore, an average value for  $xh_2$  was taken and the corrected  $h_1$  coefficients computed and plotted on Fig. 1. These internal film coefficients for water were used in all later calculations for finding the  $xh_2$  values for the various coils tested."

### Testing Procedure

"All test work was performed in a wind tunnel by means of which very constant conditions could be maintained during tests. It was also possible to duplicate very closely the required conditions for all coils tested. All air velocity measurements were taken with pitot tube readings, a traverse of 9 points being made."

"The total cooling effect was calculated from the gain in heat content of the water circulated through the coil, and was checked by the change in total heat content of the air circulated. The sensible cooling effect was obtained by subtracting the dehumidifying effect, calculated from the actual weight of the moisture condensed from the air, from the total cooling effect. A check on the sensible cooling effect was made from the difference between the sensible heat of the air leaving the coil and the sensible heat of the air entering the coil."

"All runs were taken from a minimum period of 1.5 hours, the condensate being weighed at the end of the first hour and a check being required upon this weight for the next half hour. All tonnages were required to check within 5 per cent."

### Precision Measurements

"The water flow was calibrated by weight at 20-minute intervals. The water temperatures of the coil under test were measured with precision thermometers calibrated for 1/5°. The rate of refrigerant flowing was measured by means of calibrating receivers. Actual volumetric measurements of the amount of refrigerant condensed were made."

"The test procedure for the water runs made upon the different types of surfaces was as follows:

"With 40° F. entering water and constant air velocity a series of tests was made with three water velocities; following this another series of tests was made with a constant water

(Concluded on Page 15, Column 1)

## Economical Assembly

**ACE HARD RUBBER DOORS, RAILS, JAMBS** and other parts are so well standardized in all dimensions that their use guarantees important labor economies in assembling into Display Refrigeration Equipment.

Our complete catalogue which we will send for the asking proves the simplicity with which our products may be incorporated in your structural plans.

Write to

**AMERICAN HARD RUBBER CO.**  
11 MERCER STREET, NEW YORK, N. Y.  
Akron, O. • 111 W. Washington St., Chicago

## Wagner Motors are Dependable

THERE was a time, you will probably recall, that if you drove your automobile a distance of fifty miles without tire or machine trouble you considered yourself lucky. Auto users in those days knew that their cars were not very dependable and were prepared for emergencies. Those days are over! It's dependability auto owners desire today.

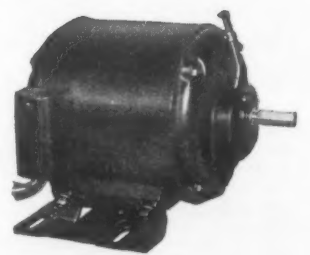
There was a time when owners of refrigerators expected frequent breakdowns. Today, however, the public is demanding refrigerators that are dependable and will operate efficiently for many years.

That progressive refrigerator manufacturers are anticipating this demand is reflected in the increasing use of Wagner motors on refrigerators. Wagner engineers with forty-four years of experience in building and servicing motors have developed a complete line of dependable refrigerator motors.

Among the distinctive features contributing to the dependability of Wagner motors is the steel-backed babbitt-lined bearings with wool-yarn lubrication—steel-backed to withstand all strains to which bearings are subjected—babbitt-lined to prevent "bearing seizure." The wool-yarn is used to carry an uninterrupted supply of filtered oil to all parts of the bearing. Photo N427A shows part of bearing housing and oilwell. A portion has been cut away to reveal construction details.

Another outstanding feature is the Wagner stator—strong and rigid, yet mechanically simple. Photo EA8 shows a view of a stator core and frame. The frame is of rolled steel—strong, rigid, will not get out of alignment—unbreakable. Stator coils are completely insulated from frame—securely wedged in place by special tough fibrous slot insulation. Complete stator core is baked in drying ovens to drive out all moisture, then while still hot it is immersed in heavy insulating varnish, selected for its penetrating and insulating qualities, to thoroughly impregnate the windings.

Dependability is but one of several qualities that refrigerator manufacturers must consider. Other considerations fully provided for in Wagner design and construction are: quietness, interchangeability, appearance, and performance. For a complete description of Wagner motors ask for Bulletin 167.



There's a Wagner motor to fit your needs, regardless of the type you prefer. Included in the Wagner line of motors are

Type RB Split Phase  
Type KA Repulsion-Start-Induction  
Type RBZ Capacitor-Start Induction-Run  
Type RZH Capacitor-Start Capacitor-Run  
Type RD Direct-Current  
Type RP Polyphase Squirrel-Cage

Wagner Motors are available in such various mechanical variations as open, totally-enclosed, or drip-proof; rigid or resilient mounted; horizontal, vertical, or flange-mounted; sleeve or ball bearing, etc.

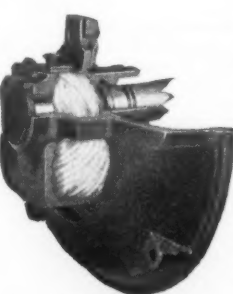


Photo N427A



Photo EA8

MOTORS  
TRANS-  
FORMERS

**Wagner Electric Corporation**  
6400 Plymouth Avenue, Saint Louis, U.S.A.

FANS  
BRAKES



"Why do you use ARTIC for servicing Methyl Chloride units?"

"Because it is highly pure, readily available, and is used by many machine builders."

ARTIC has been a standard refrigerant since 1920. It is now used for charging all or some models of 35 different makes of household and commercial units. For service work it can be obtained from authorized stock points in the United States, Cuba, Mexico and the Hawaiian Islands. It conforms to rigid specifications on moisture, acidity, residue and boiling range.

Do As Machine Builders Do—Use ARTIC

**Artic**  
IS A GOOD REFRIGERANT  
The R. & H. Chemicals  
Dept.  
E. I. du Pont de Nemours  
& Co., Inc., Wilmington, Del.



# PATENTS

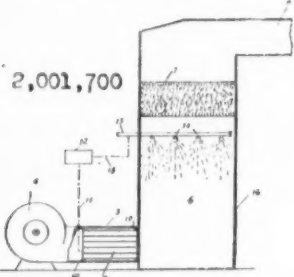
Issued May 21, 1935

**2,001,697. ABSORPTION REFRIGERATING MACHINE.** Edmund Altenkirch, Neuenhagen, near Berlin, Germany, assignor, by mesne assignments, to The Hoover Company, North Canton, Ohio, a corporation of Ohio. Application Aug. 14, 1930. Serial No. 475,206. In Germany Aug. 20, 1929. 4 Claims. (Cl. 62-119.5.)

4. The method of causing the circulation of an absorption liquid in a circuit between the absorber and the generator and a continuous absorption refrigerating system which includes the steps of causing the liquid to absorb a gas, in the absorber to thereby increase the density of the absorption liquid and expelling the absorbed gas in the generator to decrease the density of the absorption liquid, and fostering circulation of the liquid under the influence of gravity action on the portions of the absorption liquid of different density.

**2,001,700. HUMIDIFICATION PROCESS AND APPARATUS EMPLOYING ELECTRICAL ATTRACTIVE FORCES.** Hans Barthel, Cologne-Dellbrück, Germany, assignor, by mesne assignments, to Carrier Engineering Corp., New York, N. Y., a corporation of New York. Application Jan. 13, 1931. Serial No. 508,444. In Germany Dec. 3, 1929. 2 Claims. (Cl. 261-117.)

1. A method of controlling the moisture content of air, consisting in providing



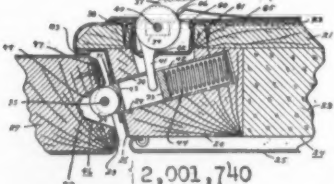
a plurality of water particles charged with electricity of a certain polarity, and routing air equally charged with electricity of opposite polarity through the particles.

**2,001,704. APPARATUS FOR COOLING AND VENTILATING BUILDINGS.** Claude A. Bulkeley, New York, N. Y., assignor to Niagara Blower Co., New York, N. Y., a corporation of New York. Application April 14, 1933. Serial No. 666,152. 18 Claims. (Cl. 257-8.)

1. In an apparatus for conditioning an enclosure, a multiple pass cooling coil, means for passing air through said cooling coil over the exterior of the pipes thereof and into said enclosure, means for passing a cooling fluid through the inside of the pipes of said cooling coil counter-current to the flow of air and at an entering temperature substantially below the dewpoint of the air passing said coil whereby said air is dehumidified and cooled to an average temperature substantially above its dewpoint and said cooling fluid is warmed to a leaving temperature substantially above said dewpoint, and means responsive to the air conditions in the enclosure for varying the velocity of said cooling fluid through said coil to vary the cooling and dehumidifying effect of the coil.

**2,001,740. REFRIGERATOR LATCH.** Hal W. McPherson, Dayton, Ohio, assignor, by mesne assignments, to General Motors Corp., a corporation of Delaware. Application Oct. 31, 1931. Serial No. 572,421. 6 Claims. (Cl. 292-173.)

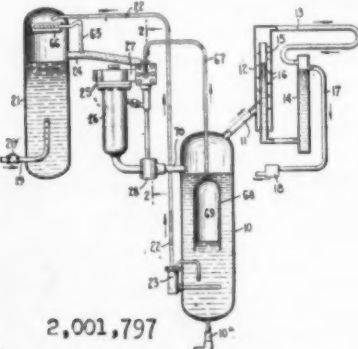
5. A refrigerator latch including a pivoted handle, a latch means, a latch operating arm forming a part of said



handle and extending into an opening, and a gasket of resilient material through which said arm extends to seal the opening about said arm regardless of the position of the handle.

**2,001,797. REFRIGERATION.** Eric H. Ryden, New York, N. Y., assignor to Electrolux Servel Corp., New York, N. Y., a corporation of Delaware. Application Feb. 2, 1932. Serial No. 590,379. 15 Claims. (Cl. 62-5.)

10. In absorption refrigeration apparatus, a generator, an absorber, means including an intermediate vessel for transferring



absorption solution from said absorber to said generator, and means for controlling the operation of said transfer means responsive to temperature in the upper part of said vessel.

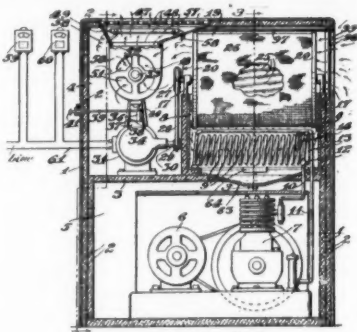
**2,001,832. AIR CONDITIONER.** Walter

Bandurski, Chicago, Ill. Application Aug. 29, 1934. Serial No. 741,968. 12 Claims. (Cl. 257-244.)

1. An air conditioner comprising a casing, an apertured end wall in said casing, a fan and motor carried by said wall for forcing a stream of air through said casing, a cone-shaped baffle axially carried within said casing and having its apex disposed toward said end wall, and air conditioning means for said air stream arranged within said casing in the form of a substantially cone-shaped coil.

**2,001,833. AIR CONDITIONING APPARATUS.** Ruddell J. Byrd, Irving, Tex. Application March 29, 1935. Serial No. 13,621. 11 Claims. (Cl. 261-92.)

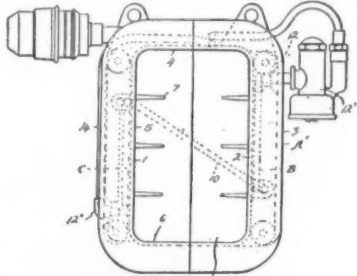
1. An air-conditioning apparatus which comprises a rotor covered with absorbent material and having spiral vanes of said



material, a tank containing liquid within which the rotor dips, thereby moistening said surfaces, means located in said tank for raising and for lowering the temperature of the liquid therein, means for drawing air through the rotor in contact with said moistened absorbent surfaces, and positive means for imparting rotation to said rotor, said rotation causing circulation of the liquid to insure uniformity of temperature through the body of the liquid.

**2,001,872. COOLING UNIT.** Harold A. Greenwald, Detroit, Mich., assignor, by mesne assignments, to Kelvinator Corp., Detroit, Mich., a corporation of Michigan. Application May 18, 1931. Serial No. 538,335. 6 Claims. (Cl. 62-95.)

6. A cooling unit having a body comprising two complementary C-shaped sections secured together adjacent the top



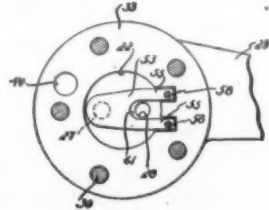
and bottom to provide a freezing zone, a refrigerant evaporating coil embedded in a side wall of said zone formed by one of said sections, a refrigerant evaporating coil embedded in the opposite side wall of said zone formed by the other section, and an independent connection between said coils.

**2,001,874. COMPRESSING UNIT.** Edward Heitman, Detroit, Mich., assignor to Kelvinator Corp., Detroit, Mich., a corporation of Michigan. Application Oct. 12, 1931. Serial No. 568,319. 1 Claim. (Cl. 230-206.)

A refrigerant compressing unit comprising a compressor having a crankcase and including a cylinder disposed above the crankcase, a valve plate arranged to close the top of the cylinder, a piston reciprocable in the cylinder, an inlet valve carried by said plate, a wall for the compressor having a passage formed therein and an inlet leading to said passage, said passage at opposite ends being in communication with the inlet valve and the crankcase, respectively, and means for supplying refrigerant vapor mixed with oil to said passage at a point below said inlet valve, said passage having a relatively large cross sectional area as compared with said inlet whereby said vapor and oil become separated by change in velocity upon entering said passage.

**2,001,885. REFRIGERATING APPARATUS.** Grayston R. Ohmart, Detroit, Mich., assignor to Kelvinator Corp., Detroit, Mich., a corporation of Michigan. Application May 11, 1932. Serial No. 610,632. 2 Claims. (Cl. 230-228.)

1. In a compressor the combination with means providing a compression chamber, said means having inlet and outlet ports



communicating with the interior of said chamber, a reed valve having a pair of relatively narrow supporting legs at one end secured to said means and constituting the sole support of said reed valve, and said valve being so positioned that the free end thereof is arranged for controlling one of said ports and the space between said supporting legs being in alignment with the other port to permit the passage of fluid through the latter port.

**2,001,912. THERMAL INSULATION.** Martin C. Huggett, Chicago, Ill., assignor, by mesne assignments, to Research, Inc., a corporation of Illinois. No drawing. Application Sept. 30, 1933. Serial No. 691,696. 2 Claims. (Cl. 154-44.)

1. A thermal insulation unit consisting of a base sheet having thereon a highly polished heat-reflective non-metallic min-

eral film; said film having a heat-reflective power approximating that of polished silver.

**2,001,923. LIQUID COOLER.** James Robertson and George H. Purdy, San Francisco, Calif. Application April 16, 1934. Serial No. 720,823. 4 Claims. (Cl. 257-183.)

3. In a cooler, a pair of spaced vertical headers, and a plurality of tubes having hollow lips thereon, and the tubes being connected in series and mounted between the headers with the lip of one tube being positioned in close proximity to the wall on an adjacent tube, each pair of those tubes which are connected having their walls at points adjacent their ends bent outwardly to provide a channel connecting the interior of one tube with the interior of another tube.

**2,002,019. AIR CONDITIONING APPARATUS.** George B. Marzoff, St. Paul, Minn., assignor to Farwell Ozmum Kirk & Co., St. Paul, Minn., a corporation of Minnesota. Application Jan. 14, 1933. Serial No. 651,661. 8 Claims. (Cl. 257-167.)

6. In an apparatus of the character described, a casing having an opening at the lower portion thereof for the ingress thereto of air to be conditioned and having an opening at the upper portion thereof for the egress of conditioned air, a drum within the casing spaced from the sides thereof, means for directing water into contact with the drum, and ingress conduit for admitting hot gases into the drum at the upper portion thereof, and a conduit for the egress of gases from the drum, said conduit extending upwardly from the lower portion of said drum and being subjected to the heat within the drum and its upper portion.

**2,002,023. AIR CONDITIONING DEVICE.** Adolph Thousand, Cedar Rapids, Iowa. Application July 28, 1933. Serial No. 682,622. 3 Claims. (Cl. 126-116.)

1. In an air conditioning device including a hot air furnace having a jacket, a conventional fluid fuel burner including a blower and a fuel pump for furnishing atomized fuel and air to the fire box of the furnace and driving means for driving the blower and fuel pump, a humidifying device for humidifying the air passing through the blower, means for controlling the admission of water to the humidifying device, means for disconnecting the fuel pump from the driving means of the fluid fuel burner, and conduits for directing air from the blower selectively into the combustion chamber and hot air jacket of the furnace.

**2,002,033. REFRIGERATING SYSTEM.** Julius F. Kopsa, Chicago, Ill. Application Sept. 22, 1932. Serial No. 634,278. 2 Claims. (Cl. 62-115.)

1. In a refrigerating system, the combination with a motor-operated compressor for compressing the refrigerant for the system and an evaporating coil connected by a pipe line to receive compressed refrigerant from the compressor, of a separator device adapted to remove foreign liquid from the refrigerant prior to passage of the refrigerant to the coil and comprising a shell connected to the pipe line so that the refrigerant passes therethrough, a blade-equipped element mounted in the shell for rotation in response to flow of the refrigerant through said shell and operative during rotation to separate all foreign liquid from the refrigerant by flinging it outwardly, and means for catching the liquid flung outwardly by the blade-equipped element.

**2,002,061. COMBINED REFRIGERATING AND ADVERTISING DISPLAY DEVICE.** Samuel G. House and Alfred B. Small, Miami, Fla. Application Sept. 20, 1933. Serial No. 690,264. 9 Claims. (Cl. 40-33.)

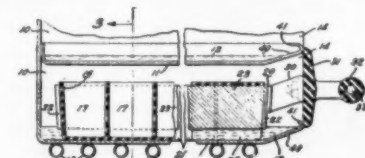
A combined refrigerating and advertising display device comprising a housing formed of a framework and transparent panels, a cylinder within the housing, spaced from the inner walls of said housing and extending substantially the full length of said housing, means for supporting the cylinder, said cylinder having sections of advertising matter thereon appearing through the panels, means for rotating the cylinder step by step for causing each section of the advertising matter to appear at all of the panels disposed in the same horizontal plane passing through said section, and a refrigerating unit for cooling water from a hydrant and enclosed in a protective manner by said cylinder and housing.

**2,002,065. COOLING TOWER.** Stanley Walter Kryszewski, Carteret, and Ernest Linwood Cahoon, Westfield, N. J., assignors to Foster Wheeler Corp., New York, N. Y., a corporation of New York. Application May 20, 1931. Serial No. 538,746. 19 Claims. (Cl. 261-109.)

1. In a cooling tower, a frame for the tower, wire mesh members supported by said frame, splash pieces and lower pieces supported by said wire mesh members, additional wire mesh members extending at right angles to said first mentioned wire mesh members and supported by the frame and lower pieces supported by said last mentioned wire mesh members.

**2,002,232. REFRIGERATOR FREEZING TRAY.** Ralph H. Chilton, Dayton, Ohio, assignor, by mesne assignments, to General Motors Corp., Detroit, Mich., a corporation of Delaware. Application Feb. 6, 1933. Serial No. 655,311. 8 Claims. (Cl. 62-108.5.)

1. In a refrigerator, in combination, a series of portable freezing trays, a series of stationary superposed individual refrigerated compartments for said trays, said compartments each having a relatively shallow liquid retaining bottom wall and



mercury retained thereupon so as to directly contact the bottom of said tray when it is in its freezing position thereon.

**2,002,234. AIR COOLING AND CIRCULATING DEVICE AND PROCESS.** Willard L. Morrison, Lake Forest, Ill. Application March 5, 1934. Serial No. 713,993. 10 Claims. (Cl. 62-176.)

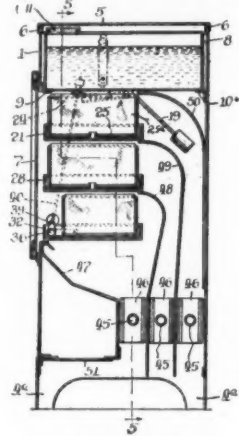
6. The process of cooling and circulating air, which consists in isolating a portion of air in a defined area open at the top and confining the bottom portion of said air against downward and sidewise movement out of said defined area, cooling air and causing it to drop by gravity into the bottom of said defined area and to displace warmer air, and causing said warmer air to rise and pass out at the open top of said defined area.

**2,002,235. AIR COOLING AND CIRCULATING DEVICE.** Willard L. Morrison, Lake Forest, Ill. Application July 26, 1934. Serial No. 737,018. 19 Claims. (Cl. 62-129.)

1. An air cooling and circulating device comprising a receptacle, a cooling device suspended at the upper part of said receptacle, the receptacle being made of flexible material, with means for holding it in its operative position.

**2,002,273. HUMIDIFIER.** William H. Parker and Harry Jaffe, Chicago, Ill., assignors, by mesne assignments, to Sears, Roebuck & Co., Application July 5, 1934. Serial No. 733,827. 5 Claims. (Cl. 251-104.)

1. A humidifier comprising a cabinet, a water tank in the upper portion of said cabinet, a shallow pan adapted to con-



tain water below the water tank, a water-absorbing unit in said pan, the lower portion of said unit being arranged to extend into the water contained in said pan, an overflow outlet from said pan, a substantially similar pan below the first-mentioned pan and arranged to receive water flowing from said overflow, a water-absorbing unit in the second pan, the lower portion of said unit being arranged to be submerged in water contained in the second pan, a float in the last-mentioned pan arranged to control the flow of water from the water tank, and partitions in the cabinet to direct air to each of said water-absorbing units.

**2,002,305. REFRIGERATOR.** Charles F. Belshaw, Indianapolis, Ind. Application April 29, 1931. Serial No. 533,693. 3 Claims. (Cl. 62-37.3.)

1. In a refrigerator a water-tight refrigerant container substantially L-shaped in vertical section having a horizontally-extended article supporting top of high heat conductivity upwardly inclined toward the vertical arm of said container and supplemented by a vertical extension forming one side of the vertical arm of said container, and the ends of the inclined top wall projecting beyond the end walls of said container, heat insulation imbedding the bottom, sides and ends of said container and the projected ends of the top plate, and a drainage passage leading from said container approximately at the level of the junction between the inclined top wall and its vertical extension, the vertical arm of the container extending substantially above the level of the drainage outlet.

**2,002,307. COMPRESSION REFRIGERATING SYSTEM FOR LOW TEMPERATURE PURPOSES.** Henry Brier and John Hornsby Brier, Dartford, England. Application Nov. 10, 1932. Serial No. 641,956. In Great Britain Jan. 9, 1932. 3 Claims. (Cl. 62-121.)

1. The improvement in the compression-refrigerating method of attaining unusually low temperatures by a refrigerant, comprising first subjecting the refrigerant to a primary evaporation to pre-cool same, then drawing the working gas or vapor from the main evaporator into a single container and adding the gaseous refrigerant from the primary evaporator, and effecting a first stage compression of the working gas from the main evaporator in the single container, thus raising its pressure to substantially that occurring in the primary evaporation zone, subjecting both charges to a second compression in said single container, and subjecting same therein to a third compression and into a condenser.

**2,002,309. REFRIGERATING APPARATUS AND METHOD.** Walter E. Carpenter, Belmar, N. J., assignor to McCabe Maier Corp., Brooklyn, N. Y., a corporation of New Jersey. Application March 28, 1932. Serial No. 601,504. 13 Claims. (Cl. 62-91.5.)

1. In a refrigerating apparatus of the character described, a refrigerant container insulated at its top, bottom and sides, and having a heat conductive bottom, a platform constituting a vertically movable part of said bottom, and upon which a mass of solid refrigerant is adapted to rest, the thermostatically controlled means arranged exteriorly of the container operable to raise the platform and shift the solid refrigerant out of direct heat exchange relationship with the bottom of the chamber.

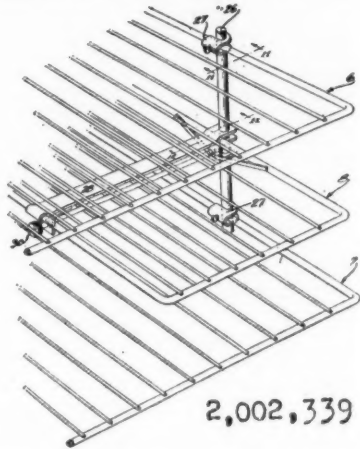
**2,002,312. FURNACE AND AIR CONDITIONER.** Ernest I. Dail, Lansing, Mich., assignor to Dail Steel Products Co., Lansing, Mich., a corporation of Michigan. Application July 30, 1932. Serial No. 626,362. 4 Claims. (Cl. 126-113.)

1. The combination of a warm air heat-

ing furnace, a jacket surrounding the same, a downwardly extending cold air conduit in heat conducting relation to said furnace to receive heat therefrom, said conduit communicating with the interior of said packet at the lower end thereof, a water spray within the portion of said conduit preheated by said furnace and a self-washing filter in said conduit between said water spray and the communication of the conduit with said jacket.

**2,002,339. REFRIGERATOR STRUCTURE.** Lloyd G. Copeman, Flint, Mich. Application Dec. 23, 1933. Serial No. 703,744. 10 Claims. (Cl. 62-89.)

1. In combination with a refrigerator of the type having a food compartment, a perforate fixedly mounted shelf extending



across the food compartment and spaced from the bottom of the main food compartment to form an auxiliary food compartment to receive articles of fairly large size, a cooling unit positioned in the food compartment for setting up a positive circulation of air in the compartment and through said shelf, a vertically adjustable perforate half shelf positioned beneath said fixedly positioned shelf, said half shelf being substantially flat and including micro-adjustment means for moving said half shelf from a point where said half shelf substantially merges with said fixed shelf to a point where said shelf substantially merges with the horizontal bottom of the food compartment whereby said entire space below the fixed shelf may be filled with large articles all the way across or said half shelf may be selectively adjusted to any position above smaller articles supported by the bottom of the food compartment and below the half shelf and thus permit the storing of food between the lowered half shelf and the fixedly mounted shelf to thereby permit filling at all times the entire vertical space between the fixedly positioned shelf, said half shelf increasing the mass of hold-over material within the food compartment without taking up any usable space and so connected with a wall of the food compartment as to accelerate the transfer of heat from food-stuffs placed thereon by head conduction through the shelf and food compartment walls.

**2,002,389. REFRIGERATION APPARATUS.** Eugene L. Barnes, Buffalo, N. Y. Application Jan. 21, 1931. Serial No. 510,138. 4 Claims. (Cl. 62-1.)

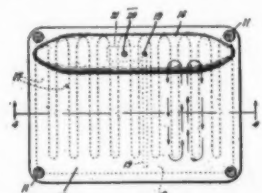
1. An iceless refrigerating apparatus, comprising a refrigerating cabinet, a food compartment arranged within the cabinet and in interspaced relation therewith, a cooling unit separate from the food compartment and in free communication with the space between the cabinet and the food compartment, the food compartment being provided with relatively small inlet openings arranged below the cooling unit, and also with relatively small outlet openings arranged in the upper portion of the food compartment and in line with the upper portion of the cooling unit.

**2,002,426. REFRIGERATING APPARATUS.** Edmund E. Allyn, Shaker Heights, Ohio. Application Feb. 25, 1932. Serial No. 595,136. 2 Claims. (Cl. 257-243.)

1. Refrigerating apparatus of the character described, comprising a heat transfer device including two concentric tubes spaced apart and secured to each other at their ends, means for circulating material to be cooled through the annular cavity between said tubes for dissipation of its heat through the surfaces of the two tubes, a receptacle for cooling medium, and a tubular heat conducting member concentric with said tubes forming a connection between the said tubes and the said receptacle and adapted to conduct heat therebetween, said connection having side openings for the admission of cooling medium to the channel within the inner tube.

**2,002,444. REFRIGERATOR EVAPORATOR.** Henry S. Woodruff, Schenectady, N. Y., assignor to General Electric Co., a corporation of New York. Application Aug. 28, 1929. Serial No. 389,047. 44 Claims. (Cl. 62-95.)

1. An evaporator for refrigerating machines including a flat upper surface for supporting articles to be frozen and a



header extending along one edge of the evaporator, said evaporator having a plurality of passages extending from said header to the opposite side of said flat surface for the circulation of refrigerant therethrough and having a passage extending along the edge thereof communicating with the passages extending from said header.



## ENGINEERING

Table 1. Coils Tested by Procedure Outlined

Coil No.	Description of Surface	Comparison
1	1/4 in. bare pipe.	
2	Continuous flat fin. .022 in. aluminum fin-spaced 6 per in.—3/4 in. O.D. copper tubes—2 in. tube centers—interlocking type mechanical bond.	
3	Continuous flat fin. .022 in. aluminum fin-spaced 6 per in.—3/4 in. O.D. copper tubes—staggered tubes in refrigerant circuit. Interlocking type mechanical bond.	Same as 2 with exception of added staggered tubes in refrigerant circuit.
4	Continuous flat fin. .022 in. aluminum fin-spaced 6 per in.—3/4 in. O.D. copper tubes—staggered tubes for turbulence only—interlocking type mechanical bond.	Same as 3 but with staggered tubes cut out of refrigerant circuit.
5	Continuous flat fin. .022 in. aluminum fin-spaced 6 per in.—3/4 in. O.D. copper tubes—staggered tubes for turbulence only—mechanical bond with fin ferrule at hole.	Same as 4 but without interlocking bond.
6	Continuous flat fin. .0189 in. copper fins—spaced 6 per in.—3/4 in. O.D. copper tubes—staggered tubes for turbulence only—entire coil tinned—dipped to obtain metal bond.	Same as 5 but using .0189 in. copper fins, tin-dipped bond instead of mechanical bond.
7	Individual 2 in. square fin. .022 in. aluminum—spaced 6 per in.—3/4 in. O.D. copper tubes—2 in. tube centers—mechanical bond—no ferrules formed on fins.	
8	Continuous corrugated fin. .0135 in. copper—spaced 4 per in.—3/4 in. O.D. copper tubes—2 in. tube centers—tin-dipped bond.	
9	Spiro Fin. .030 in. steel fins—spaced 4 per in.—3/4 in. steel pipe—galvanized bond.	
10	Spiro fin. .015 in. copper fins—1 in. high—spaced 4 per in.—3/4 in. steel pipe—tin-dipped bond.	
11	Spiro fin. .015 in. copper fins—13/32 in. high—spaced 8 per in.—3/4 in. O.D. copper tubing—tin-dipped bond.	

## Development Rating Of Extended Surface

(Concluded from Page 16, Column 5) velocity and variable air velocities. The three water velocities gave an accurate check upon the  $xh_2$  coefficient, since the external condition varies only with the air velocity. The variable air velocities gave sufficient information to find the variation of  $xh_2$  with air velocity. Table 1 gives a list of the coils that were tested under the above outlined procedure.

## Results of Tests

"The results of the tests on the surfaces listed in Table 1 were con-

duced to the form shown in Table 2, which form the writer feels, is the most convenient method.

"By means of formula (2) and the  $xh_2$  coefficients of Table 2, it is possible to compute the overall nominal K values for many combinations of surfaces. In making up Table 2, coils were selected so as to study the effect of turbulence, ratio of secondary to primary surface, changing of effective fin height, and effect of bond.

"The increase obtained by staggering the tubes to create turbulence in the air flow is shown by the results from coils 2 and 4. Comparing the  $xh_2$  coefficient of coils 3 and 4 the effect is shown of reducing the effective fin height, since the effect of decreasing the ratio of secondary surface is taken into account by using

equation (2).

"In this comparison, it was equivalent to decreasing the effective fin height from .750 in. to .635 in., effective fin height being the distance from the tube to the edge of a circular fin, having the same area as the square fin. Equation (3) may be applied here to obtain an approximation as to what percentage increase in the fin efficiency,  $x$ , could be expected with the above decrease in fin height.

"As has already been stated, equation (3) cannot be used to compute actual fin efficiencies for any other type than a bar fin. However, by approximating a value for  $h_2$  somewhere in the air-conditioning range a fair estimate may be had as to the percentage change in  $x$ , for small variations of the other variables.

"By the above method it was estimated that a 5 per cent gain would be all that could be expected from the above decrease in fin height. Since the test results showed a 16.5 per cent gain, this additional gain can be attributed to the greater number of bonds. In other words, a poor bond would create a high resistance to heat flow with the result that there would be a large temperature gradient between the base of the fin and the tube.

## Tin-Bond, Corrugated Fin Gives Highest Value

"Coil 3 having 55 per cent more tubes than coil 4 for a given fin area would have less heat traveling through each bond. This would result in a smaller temperature gradient through the bond, thus making the fin capable of doing more work.

"Comparing coil 6 with 4 shows the gain obtained by going to a tin-dipped bond. Formula (3) shows that .0189 in. copper would give approximately a 6 per cent increase in the  $xh_2$  value as compared with the .002 in. of aluminum. Thus, it is reasonable to say that a 30 per cent increase due to the use of a tin-dipped bond.

"Coil 8 was tested to show the increase in external film coefficient that could be expected by corrugating the fin to create turbulence."

Table 2. External Film Coefficients for Various Types of Extended Cooling Surfaces

(All values are from nominal  $K_f = 800$  ft./min. net air velocity†) Type of  $xh_2$  film coefficient, B.t.u./surface from ft.<sup>2</sup> of external surface Table 1 and °F. through film

1	13.3
2	11.5
3	10.2
4	9.3
5	9.0
6	7.7
7	7.2
8	6.6
9	6.6
10	6.6
11	5.8

†For definition of nominal  $K_f$ , see Rating of Surface. For all practical applications it may be considered the same as dry K.

‡Net Air Velocity is air velocity through free area. Thus, the effect of fin spacing and tube size upon  $xh_2$  is partially eliminated.

## Century Announces New Line of Motors

ST. LOUIS—Century Electric Co. has just introduced a new line of squirrel-cage normal-torque and high-torque motors—especially designed for refrigeration and air-conditioning applications.

The designers claim for this new line, a composite performance of torque, efficiency, power factor, and quiet operation, which predicated on past experience and observation is best suited to the operation of this type equipment, including the latest designs of Freon compressors.

Special attention has been paid to mechanical stability, which Century Electric engineers declare to be essen-



tial to the successful operation of this type of application. This construction includes cast frame and end brackets, ample sized shafts and bearings, and well anchored field and rotor cores.

Corresponding electrical ruggedness is provided through the use of the latest offerings of the wire drawing industry, including electrolytic copper bars and end rings so joined as to form an homogeneous high conducting joint.

These motors are available in sleeve or ball bearing designs as required and are available in sizes 600 hp. and smaller.

## Parker Perfects Spray Method of Applying Rust Proofing

DETROIT—Supplementing its well-known immersion Bonderizing process, Parker Rust Proof Co. has announced a new method of application "Spray-Bonderizing" for stabilizing paint finishes on iron and steel.

Heretofore, Parker officials claim, Bonderizing was always accomplished by the immersion method in still tanks, either by submerging the production on racks, or by passing the articles to be processed through a large tank on a conveyor, which required from two to five minutes in the solution, depending on the nature of the article being treated.

Spray-Bonderizing chemically produces a typical rust-resistant phosphate coating that provides an adherent base for paint, enamel, or lacquer. The process is accomplished by spraying the processing solution onto the production as it passes through the Bonderizing section of a completely mechanized conveyor line, including cleaning, Bonderizing, rinsing, and drying.

Spray-Bonderizing is said to make possible the production of phosphate coatings at lower temperatures and lower chemical concentration than has been possible with an immersion process. The pressure spraying accelerates the chemical reaction and produces both a cleaning and coating action in one operation.

Processing time has been reduced to 60 seconds as against two to five minutes by immersion.

Other advantages due to the shortened processing time, Parker officials say, are that equipment requirements are minimized, steam requirements are lower, less floor space is needed, and by recirculating the solution, it is possible to process a given amount of work with a smaller volume of solution.

As the work progresses on the conveyor line through the various steps of cleaning, Spray-Bonderizing and rinsing, it passes a series of small standpipe sprays which force the solution against the material from every conceivable angle, flooding all areas to be treated. Equipment is assembled in a steel housing with reservoirs below, where solutions are accumulated, ready for circulation.

## Young &amp; Quinn Speak At National Homes Conference

LAFAYETTE, Ind. — Owen D. Young, chairman of the board, and T. K. Quinn, vice president of General Electric Co., were featured speakers at the first annual National Homes Conference here June 1 (Saturday), when representatives of the building and allied industries met with Purdue University technicians to seek a scientific approach to home construction.

Principal objectives of the meeting were: 1) an immediate stimulation of the building industry; 2) scientific designing of all homes; 3) development of materials and methods of construction which will enable persons with moderate incomes to own better homes.

All of Purdue's technical knowledge and laboratory facilities have been pledged to aid in the concerted drive to relieve housing conditions. All industry has been asked to cooperate.

Plans for a gigantic "test tube" to aid in the work were announced at the university as the conference opened. An "all-weather" building, in which houses may be built and tested, will be constructed at Purdue.

It will contain facilities for testing houses and materials under all climatic conditions from zero weather to tropical heat, desert dryness or great humidity, and under the blazing sun rays.

Designers expect it to be valuable in testing efficiency of various types of insulation, heating systems, and new air-conditioning plants.

The university has also purchased a 140-acre tract adjoining the campus for development of an ideal community.

## 1,300 Ranges in Operation In Town of 5,000

OCONOMOWOC, Wis.—In this town of 5,000 population there are 1,300 electric stoves in operation reports Harry Billett, president of the Oconomowoc Electric Co. This firm recently sold 110 electric ranges during a campaign.

The marketing of electric ranges by the company is conducted on the following basis:

The Oconomowoc Electric Co., a municipal plant, purchases current for its territory from one of the power companies in the state. Electrical dealers in the area sell ranges for the electric company, and the purchaser is billed monthly on his electric bill for payments on the range.

## Currie Named Asst. Universal Engineer



WILLIAM CURRIE

DETROIT—Appointment of William Currie as assistant chief engineer of Universal Cooler Corp. was announced last week by F. S. McNeal, president.

Mr. Currie has been connected with the refrigeration industry since 1925, joining the Nizer Corp. at that time as assistant engineer, and remaining with that company during its merger with Kelvinator until 1929, when he joined the old Copeland company.

On leaving Copeland in 1932 he joined Stewart-Warner Corp. in charge of its laboratory on refrigeration. In 1934 he went with the Long Mfg. Co.

## Torrance Is Honored by Big Machinery Group

HOT SPRINGS, Va.—Henry Torrance, president of Carbondale New York Co., New York City, was elected an honorary member of the Refrigerating Machinery Association during the annual meeting of the organization here May 24 and 25.

Mr. Torrance is retiring from active duty after a long career in the refrigerating machinery field. His RMA honorary membership gives him the privilege of attending association meetings and participating in the discussions held there, but carries no voting right.

The present list of honorary RMA members now includes, besides Mr. Torrance, Louis Baron, N. H. Hiller, J. S. Louis, and C. J. Staples.

## 'Kitchen of the Air' Put on By Minneapolis Store

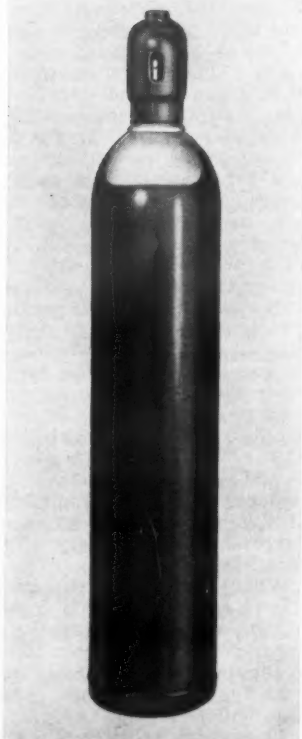
MINNEAPOLIS—The Dayton Co., department store here, in cooperation with Reinhard Bros. and Norge Corp., has been conducting a "Kitchen of the Air" program over radio station WCCO at 1:30 p. m. every day for the past few weeks.

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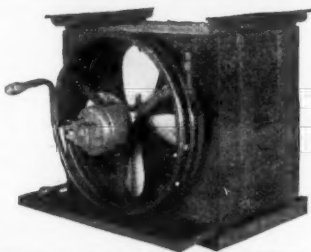


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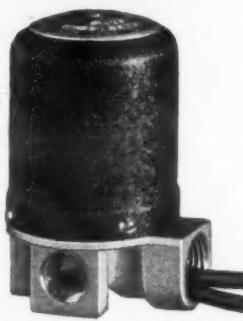
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## SERVICE

### SERVICE OPERATIONS

A SERIES OF LESSONS OUTLINED FOR THE USE OF THE SERVICE MANAGER  
IN INSTRUCTING BEGINNERS IN SERVICE WORK

#### No. 8—Testing for Methyl Chloride Leaks

By K. M. Newcum

##### REASON:

It is absolutely necessary to test each connection for leaks after the necessary repairs have been made, as any leak, regardless of how slight, will in due time cause the system to become short of refrigerant. Methyl chloride has a faint, sweet smelling odor, and cannot be tested with ammonia, like sulphur dioxide.

##### PROCEDURE:

###### Soap lather test.

- Secure a small metal cup and in it place a small piece of shaving soap or any good soap that will make a heavy lather.
- Add water to the soap just as you would prepare a lather for shaving.
- Apply the lather with a small brush completely around and over every joint to be tested.
- Hold the light from a torch (flashlight) in such a manner that the entire joint can be inspected.
- If there are any leaks, it will be indicated by the formation of small bubbles. (In event of a leak, repair the leak and repeat the test.)
- Check with instructor.

**Oil Test Method:** In event you do not have and cannot obtain soap and lather, oil may be substituted for the lather, following steps C, D, and E. Where the oil method is used, a heavy grade of oil should be applied to the joints, as a light grade will run off before a test can be made. Wipe all traces of oil from joints after tests have been completed.

## Care and Servicing of Gaskets And Shut-Off Valves

By K. M. Newcum

*Editor's Note:* Mr. Newcum's articles constitute a manual of information on present-day refrigeration systems which will add to the service man's knowledge of refrigeration, and which will assist him in meeting specific problems in servicing operations in the field.

Discussed in this article are the care and servicing of compressor and shut-off valves, gaskets, and the construction, use and servicing of condensing unit shut-off valves.

The first article in the series, which was published in the April 10 issue of the News, dealt with the fundamentals of refrigeration. Inasmuch as refrigeration is really a process of the removal of heat from a given space, these "fundamentals" consist mainly of the terms, definitions, and physical laws which are involved when heat is transferred from one substance or space to another location.

In the second article, appearing April 17, the three principal parts of the refrigeration system—cabinet, evaporator, and condensing unit—were described briefly and the operating cycle of a refrigerator was explained in detail. Also published with this article was the refrigerant pressure-temperature chart and an explanation of service gauges.

Properties which are necessary for a good refrigerant were explained in the third article which appeared in the April 24 issue of the News. The article also gave a detailed comparison of the physical properties and characteristics of the following refrigerants: sulphur dioxide, methyl chloride, ethyl chloride, ammonia, and Freon.

Listed in this article are the kinds of refrigerants being used in the various household refrigerator systems which are now being manufactured, and in some which are no longer manufactured.

The instalments published in the May 1 and May 8 issue dealt with reciprocating compressors and their component parts. The May 1 article described the compressor body assembly, housing assembly, crankshaft and connecting rod assembly, eccentric shaft and connecting rod assembly, piston and piston valve assembly, and discharge valve assemblies.

Service operations on these various compressor parts are outlined. The May 8 article dealt with different designs of stuffing box seals, operating principles of these seals, methods of servicing seals, compressor flywheels, direct-connected units.

Rotary compressor design and operation were described in the May 29 issue. Norge and Majestic makes of rotary compressors were described in some detail. Parts in the rotary

compressor assembly were explained, and methods of servicing suggested.

Mr. Newcum's articles are illustrated with photographs, drawings, and diagrams.

#### 59. Compressor and Shut-Off Valve Gaskets

Gaskets of several different materials are used for the many gasket joints in the condensing units. There are two distinct differences as some gaskets are made of a composition while others are either lead or of an alloy using lead as a base.

The lead or alloy gaskets may be used with any refrigerant, and for any gasket purpose. One point to consider with the metal gasket is that they have no definite resiliency, and should be checked for leaks where they are used in a location where expansion and contraction, or vibration might tend to loosen the bolts.

Composition gaskets that are treated with rubber should not be used with methyl chloride as the methyl chloride may attack the rubber, resulting in leaks. A simple test to determine if rubber is present may be made by burning a part of the gasket. The presence of rubber will be detected by the odor.

Most of the gasket surfaces on the compressor assembly are rigid, and do not have any "give" to compensate for irregularities in gaskets or rough uncleaned surfaces. Metal gaskets usually do not adhere to the surfaces, but come off clean.

Composition gaskets often stick tightly to the gasket surfaces, particularly where there has been heat present; for example, cylinder head gaskets. It is sometimes necessary to wedge between the two ports to separate them.

Care should be exercised at these points to prevent breaking any of the ports. The residue gasket material should be scraped clean from each surface, before reassembling. A mill file, ground square and sharp on the flat end makes a very effective tool for this work.

When convenient the gasket faces should be refaced on a surface block to remove any high spots that might exist. Where a surface block is not available, a wide mill file may be run over the faces and the high spots, if any, will show up.

These high spots should be removed, for gaskets used in refrigeration systems are usually thin and do not have sufficient body to compensate for irregularities.

A thin film of compressor oil applied on both sides of the gasket and on

both gasket faces will materially aid in effecting a tight joint.

Bolts and cap screws employed at the various joints are considerably lighter than those used on the automobile engine and considering that the gaskets have little cushion, the service man should use only a limited pressure on a relatively short wrench to tighten the bolts.

A good, clean, perfectly smooth surface and a new gasket with a film of oil may save many leaks, eliminate broken bolts, and a good deal of time.

#### 60. Condensing Unit Shut-Off Valves

Most of the open type (conventional) condensing units are equipped with manually operated shut-off valves for the convenience of servicing the unit. Some of the units employ four service valves, while others generally expected to be replaced only in the field are equipped with two, one or sometimes no valves.

On the compressor body assembly, usually on the side and always over the return gas port, will be found the suction line shut-off service valve. The purpose of this valve is to provide a manual shut off between the suction line and the compressor body for servicing purposes.

The most common valve used is the two bolt flanged type, which with the use of a gasket, is bolted to a like flange on the compressor proper, usually integral with the casting.

This location provides a convenient place for attaching the compound gauge for testing the pressure on the low side of the system. The type of valve commonly used is of the two-way type illustrated in Fig. 73.

This so-called two-way compressor valve has three openings. One opening or connection is in the front of the valve body on to which the suction line is connected. This opening may be closed by turning the valve all the way to the right, which stops the flow of gas between the head of the stem and the suction line.

The opening on the top of the valve, which is known as the gauge port may be closed by turning the valve all the way to the left, or counter-clockwise. This is known as back seating the valve.

The third opening is through the center of the flange to gas port in the compressor. This opening remains open regardless of the position of the valve stem head. All of the openings will be open to one another if the valve stem head is turned in half the way. The gauge port is fitted with a brass pipe plug when not in use, as a service connection.

The general function of the valve is as follows: When the system is in normal operation the valve is back seated and the plug tight in the gauge port. This provides for an unrestricted flow of heat-laden vapor down the suction line, through the end connection, through the valve body, and in through the gas port to the intake area of the compressor.

To install the gauge the plug may be removed, for as the valve is back seated this opening is closed and no gas will be lost or no air will be admitted to the system. When the gauge is tightly inserted or connected by means of a tube and a fitting, the valve is then turned clockwise off the back seat.

The connections should be properly tested for leaks under pressure, as indicated on the gauge. Should the normal operating back pressure wish to be determined it may now be done with the valve opened just slightly off the back seat, all connections between the system and the gauge are open, while a normal passage through the valve is still provided.

Should the compressor efficiency wish to be determined the valve should be closed (turned all the way to the right). This prevents or stops

(Concluded on Page 17, Column 1)

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## INSTALLATION OPERATIONS

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### No. 8—Installing a Coupling in a 1-2 in. And 1-4 in. Line (Flared Fittings)

By K. M. Newcum

#### TOOLS NEEDED:

One set flaring tools (refer to lesson No. 2), two 1 inch and two 1/2 inch open-end wrenches.

#### MATERIALS NEEDED:

- Two pieces of 1/2-inch tubing 6 inches long.
- Two pieces of 1/4-inch tubing 6 inches long.
- Two 1/2-inch flare nuts.
- Two 1/4-inch flare nuts.
- One 1/2-inch double end union (coupling).
- One 1/4-inch double end union (coupling).
- One roll friction tape.

#### PROCEDURE:

1. Flare one end of each piece of tubing, both sizes. Refer to operation No. 2.
2. Examine all flares with instructor.
3. Screw 1/2-inch coupling into flare nut on flared end of tubing.
4. Tighten this joint using two open-end wrenches, one on the flare nut and the other on the fitting.
5. Screw the other 1/2-inch flare nut onto the coupling and tighten same as step number 4.
6. Proceed in the same manner with the 1/4-inch coupling, using the smaller wrenches, as there is less danger of stripping the threads.
7. Bend the 1/4-inch tubing in such a manner as shown in diagram so there will always be room to use wrenches on either coupling without disturbing the other.
8. Tape the 1/2-inch and 1/4-inch tubing together, 3 inches back from the 1/2-inch coupling.
9. Check with instructor.

## Service Instructions on Shut-Off Valves For Condensing Units

(Concluded from Page 16, Column 5) the flow of gas from the suction line to the compressor and a vacuum will be drawn on the compressor, which by reason of the fact that only one opening can be closed at one time, two will remain open.

In this case the opening from the compressor through the valve body, through the gauge port, and into the gauge will be open, hence the gauge will register the pressure within the suction side of the compressor only. When the valve is closed as above described the compressor should draw around 25 to 27 inches of vacuum in a few seconds, providing there is no liquid refrigerant in the crankcase which will be indicated by the crankcase being abnormally cold.

If the high is not attainable the compressor may be said to be inefficient. This may be due to a leaky piston or suction valve or discharge valve (reciprocating type only).

To determine which of the two conditions exist, stop the compressor. If the highest possible vacuum obtained, as registered on the gauge, remains constant with the compressor idle, the inefficiency may be laid to the piston or suction valve leaking.

If the gauge pressure builds up with the compressor idle and the suction line shut-off service valve is closed, the discharge valves are leaking, the pressure back from the high side to the low side is causing the gauge pressure to rise.

When repairs, if any, have been made, the valve should be back seated

and the gauge or/and gauge connection removed and the plug reinstated snugly in the gauge port. The plug should never be removed from the port unless the valve is back seated tightly for if the valve is not back seated any pressure above 0 lbs. gauge in the system will be admitted to the atmosphere, or if the pressure in the system is below 0 lbs. gauge or in a vacuum, air will be drawn into the system.

It is also through this gauge port that refrigerant in the form of gas

### Valve with Cap

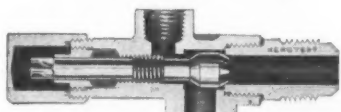


Fig. 73—Two-way valve with seal cap over stem.

may be added to the system, and oil may be drawn into the crankcase where other means of adding oil is not provided.

By always firmly back seating the valve, which forms a metal to metal back seat as may be noted from the illustration, the pressure from the system is closed off from the packing around the stem, thus precluding the possibilities of leaks through the packing.

The valve illustrated in Fig. 73 is provided with a seal cap, which by means of a metal gasket forms a gas-tight joint beyond the packing. This cap should always be properly tightened when through using the valve.

Another two-way valve of the same type has the stem exposed. It is necessary to tighten the packing nut as well as back seat the valve with the exposed stem to insure against leaks.

The end of the valve stems are machined square for wrench operation. The squares on different makes vary in sizes, the smallest square being 3/16 in., while the next and possibly the most popular size is 1/4 in. Some manufacturers used a 7/32 in. square and others have a 5/16 in. square. Larger size valves for large commercial and air-conditioning compressors have longer stems and squares.

Special valve stem wrenches with a square opening only should be used to operate the valve stems. These

wrenches are obtainable for all the different size stems. The use of adjustable or make-shift wrenches on valve stems soon round off the square and the valve is then very difficult to operate.

### 61. Discharge Shut-Off Service Valve

A two-way valve usually the same type and often the same size is employed between the compressor cylinder head and the condenser.

This valve, known as the discharge shut-off service valve, provides for manually controlling the flow of high pressure gas from the compressor to the condenser and also provides a gauge port for attaching the pressure gauge.

The flanged valve body is bolted over the discharge port, and the connecting line from the condenser is connected to the outlet on the valve.

The normal operating position of the valve is back seated. While the valve is back seated, the plug may be removed from the port and a pressure gauge installed. The valve may then be opened about one turn and the pressure existing on the high side will register on the gauge.

As this valve is connected to the topmost point of the condenser, and as any air or foul gas in the system collects at this point, the valve gauge port provides an opening for purging off these foul gases, which result in high operating head pressures.

Very often it is necessary to remove the compressor assembly from the system for replacing or repairing. This may be accomplished with but little loss of gas by closing the suction line shut-off service valve and the discharge shut-off service valve.

The bolts may then be removed from the valve flanges and the valves still attached to their respective lines removed from the compressor at the gasket surfaces. The high pressure gas in the condenser, etc., is trapped ahead of the valve, and the return gas in the suction line is likewise trapped.

In changing or repairing a discharge or piston valve it is first necessary to close the suction line service shut-off valve, operate the compressor until the compound gauge pressure is 0 lbs., stop the compressor, then close the discharge shut-off service valve. The gas trapped between the discharge valve and discharge shut-off service valve will be lost to the atmosphere, when the valve bolts are removed.

#### Testing Discharge Valve

Another method of testing the discharge valve for leaks is to install the pressure gauge in the discharge shut-off service valve. Close the valve under normal idle pressure. If the pressure remains constant on the gauge the discharge valve is not leaking pressure back into the low pressure side of the system.

If the gauge pressure drops rapidly it is evident that the pressure in the cylinder head is leaking back through the discharge valve and it should be repaired or replaced.

As these valves are of the back-seating type, they may be repacked under pressure, providing the valve is back seated. The packing gland may be removed, and then the packing removed with a sharp instrument. An ice pick with the point bent to about a 60° angle makes an excellent tool for this use.

New packing of the type supplied by the manufacturer should be used to replace the old. All valves do not use the same packing, as the packing chambers may vary in length and diameter with the particular manufacturer's design.

The valve stems are replaceable in most valves of this type. The valve must be completely removed from the system and installed in a vice. The body should be heated with a blow torch to run the solder between the valve body and the flare spud. When the solder has begun to run, the flare spud may be unscrewed with a hex socket wrench. The valve stem may then be screwed out through this opening and replaced with a new opening.

Before repacking the end fitting or flare spud examine the face against which the valve stem head seats. If it is scored or damaged, replace it with a new one and resolder it into place. Parts of valves of different manufacturers are usually not interchangeable.

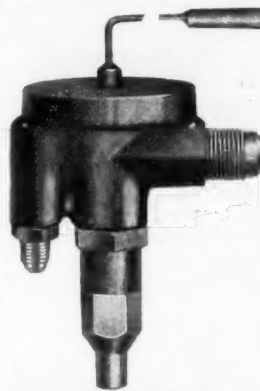
### Enochs Moves to Larger New Orleans Store

NEW ORLEANS—Enochs Sales Co., distributor and agent for manufacturers of refrigeration supplies, has moved its New Orleans store to larger quarters at 805 Howard Ave. here, reports Iddo W. Lampton of that organization.

The Enoch's Sales Co. entered the refrigeration supply business in 1932, maintaining a warehouse in Fernwood, Miss., and specializing in mail order business. In a short time the company expanded and opened a warehouse in New Orleans.

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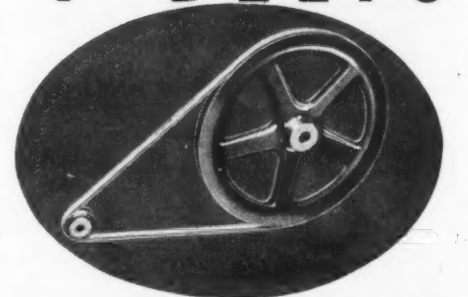
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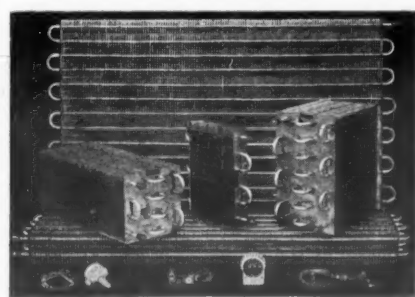
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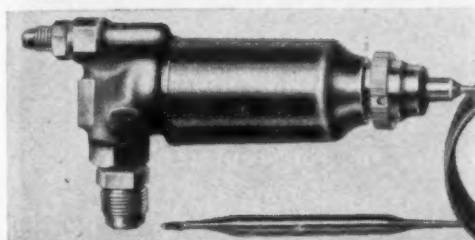
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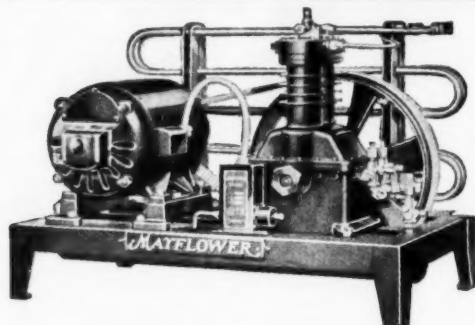
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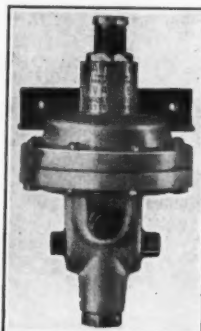
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The Barostat Valve is designed and built for positive seal. The tension of its resilient diaphragm actively presses the valve against its seat with a force which never relaxes up to the very instant of opening. There is no chance for creep, no toggle, no wedge and rollers. The valve seat and stem (both stainless steel) are ground and fitted with extreme precision and every pair is tested for perfect seal.

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## REFRIGERATION PARTS

An Old Established Supply House

Distributors for Nationally advertised refrigeration parts and supplies including such well known lines as—

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- \* LARGE RECEIVERS
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**"FROSKIST"**

for

FREEZER CASES

ICE CREAM CABINETS

WATER COOLERS

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A limited number of recent volumes are available. Each of the following volumes contains all weekly issues of Electric Refrigeration News issued during a period of four months. Stiff paper board covers.

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Vol. 11—Jan. 3 to April 25, 1934. (Serial Nos. 250 to 266.)  
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Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.



### CONDENSING UNITS AND COMPRESSORS FOR HOUSEHOLD REFRIGERATION

BY  
**JOMOCO, INC.**

A SUBSIDIARY OF THE  
**JOHNSON MOTOR CO.**

Waukegan, Ill.  
CABLE ADDRESS: JOMOCO-WAUKEGAN

### DOMESTIC COOLING UNITS

Manufactured in sizes from 2 to 8 trays direct expansion type. Ideal for the assembler of Household Refrigerators or for replacements.

Attractive Prices

**HAROLD L. SCHAEFER, INC.**  
1620 Harmon Place Minneapolis, Minn.

## Ways of Overcoming Prospect's Fear Are Told by Richardson

CLEVELAND—Addressing a recent meeting of the Electrical League of Cleveland, attended by 250 dealers and salesmen, Howard E. Richardson, assistant to the president, Crosley Radio Corp., spoke on the subject, "The Greatest Business in the World—The Business of Selling."

Mr. Richardson said in part: "Coupling this greatest business in the world—that of selling—with one of the fastest moving industries in the world—the electric refrigeration industry—offers unusual opportunities to specialty salesmen."

"Although electric refrigeration is one of the easiest selling major electric appliances in the field today, the retail salesman is still confronted with many problems and often meets with discouragement. Manufacturers engaged in this industry are taking cognizance of the salesman's problems and have made a concerted effort in advertising and sales promotional plans, all with the object in view of helping the salesman at the point of contact. It is an acknowledged fact that nearly everyone desires to own an electric refrigerator."

"Then why doesn't everyone buy one? Why do so many resort to all kinds of excuses, postponing the day of acquiring an electric refrigerator for their home?"

"The answer is Fear—fear on the part of the prospective user of being unable to fulfill the obligation."

"If the salesman can approach the subject in such a manner as to eliminate that fear, revealing actually how easy it is to become the owner of an electric refrigerator, a sale usually results," Mr. Richardson stated.

"This fear is most often eliminated by pointing out to the prospect the possible savings in the food bill through increased storage capacity and better refrigeration—plus the amount of money that they spend for ice."

"In the majority of homes these two saving factors added together provide the monthly amounts required to own and enjoy the conveniences of electric refrigeration."

In closing, Mr. Richardson urged the group of retail salesmen to remember these inspirational words of an unknown author:

"There are no dull days, dull lives or dull times. There are only dull men. There is not a single job in the world, however humble, but that it has a color and an inspiration entirely its own. There are no handicaps, there are no limited opportunities. There are only the limitations with which we narrow our vision and destroy our dreams."

## Outdoor Display Aids Sales of Dealer

ST. LOUIS—A. M. Smith Sales Co., Grunow refrigerator dealer here, has developed an advertising scheme which works for him 24 hours a day.

He has placed a refrigerator on the sidewalk in front of his store, and has painted his sales message on all sides of it. Attention is called to the low rate of payments, long guarantee, and the passer-by is invited to come into the store for particulars.

Regular oil paints were used in painting the refrigerator. These are removable with gasoline.

The dealer is confident that after he has abandoned this advertising stunt he will be able to dispose of the display refrigerator without much trouble, and in this way keep his advertising expense low.

## Early Results Announced In Modernization Drive

NEW YORK CITY—Preliminary results for the various properties participating in the Modernization Sweepstakes conducted by the Utilities Management Corp. here are as follows:

In the metropolitan Edison-New Jersey territory, company and dealers sold 1,136 electric ranges, 874 electric water heaters, 439 gas ranges, 223 gas water heaters.

In the Binghamton area company and dealers sold 528 electric ranges, 380 electric water heaters, 87 gas ranges, and gas water heaters. Company dealers in the Lancaster-Lockport group sold 54 electric ranges, 16 electric water heaters, 184 gas ranges and 102 gas water heaters.

Eastern New York company and dealers sold 203 electric ranges, 21 electric water heaters, 46 gas ranges, and 84 gas water heaters.

Among properties eligible for prizes in the Modernization Sweepstakes Pool, Lancaster-Lockport, Patchogue and Eastern New York are leading for first, second, and third places in the electric division. In the gas division, Eastern New York, Lancaster-Lockport and Electric & Gas Utilities are leading.

## Air-Conditioned Quarters for Penguins



Kept comfortably frigid in this room aboard the Jacob Ruppert, more than a dozen Antarctic penguins were brought back to the U. S. by Admiral Byrd. The penguins' quarters included a swimming pool—also refrigerated. Walls, floor, ceiling of the room were insulated with Dry-Zero.

## Westinghouse Holding Sales Schools in Fifty Cities

PITTSBURGH—Retail and wholesale sales schools are being conducted in 50 leading cities throughout the country by the refrigeration department of the Westinghouse Electric & Mfg. Co. under the supervision of two crew leaders, P. C. Wilmore and C. H. Moran.

Dramatizations and presentations will be used to demonstrate the features of the new Westinghouse models, instead of the usual lecture and picture method of instructing sales groups. The crews are carrying approximately two tons of technical apparatus for stage scenery and background for the demonstrations.

Educational training for the retail and wholesale salesmen consists of dramatic demonstrations, illustrated lectures, sound films, and round table discussions.

Curriculum includes a description of the product, methods of manufacturing and production, problems of distribution, sales stories, methods of approach, home calls and demonstrations, and canvassing.

One of the demonstrations used in the sales schools is the insulation test. A large recording thermometer is connected to the inside of the cabinet and another thermometer fastened to the exterior end of the cabinet. Results from the thermometer are transferred to two hand-operated pasteboard thermometers about 5 ft. high.

When the initial recordings have been taken, six 1,000 watt heaters are arranged in a semi-circle around the front of the cabinet at a distance of 12 to 15 ft. After the initial reading the heat is turned on and the readings of the inside and outside cabinet temperatures are recorded on the thermometers. Temperature outside increases from 90° to about 120° F.

After being subjected to the test for about 45 minutes, it is shown by the thermometers that the inside temperature remains practically unchanged and ratio of the running time of the compressor still one to five.

At the conclusion of 15 minutes added exposure, sufficient heat had penetrated the cabinet to raise the inside temperature from two to four degrees.

## Salesman Breaks 3-Mo. Quota within 18 Days

NEW YORK CITY—J. Boyleston, Northern Union Gas Co., an affiliation of the Consolidated Gas Co. of New York, broke his three-months quota of 26 Electrolux retail sales for April, May, and June, in 18 calendar days.

By April 19 he had sold and installed 29 Electrolux refrigerators in a territory consisting mainly of apartment houses. On his record day he made five sales which brought in a total of 13 installations for the day.

New York retail men are permitted to solicit one, two, three, and four-family dwellings. Mr. Boyleston closed two dwellings of four families each; two dwellings of two families each; and one individual sale. In addition to breaking his quota, he sold six insulated heat-controlled gas ranges.

A member of the same sales force, Mr. Gerard, made 21 installations between April 1 and April 18, against a quota of 22 for three months. Mr. Gerard also sold five individual retail sales in one day during this period. Selling five refrigerators in one day entitles both salesmen to belong to the "Quintuplets Club."

## Sales Boom for Leonard Dealer in Small Town

NACHES, Wash.—In this town of only 423 persons, Moore Bros. Hardware Co. sold 23 Leonard electric refrigerators last year, and up to the first of May had reached half of that number this year.

Moore Bros. Hardware Co., carrying everything from a kerosene lamp to an electric refrigerator or a \$2,000 orchard spraying outfit, serves the surrounding territory in the fruit belt of eastern Washington.

## Town Crier Publicizes Westinghouse Show

PROVINCETOWN, Mass.—The Provincetown Town Crier was recently hired by the Provincetown Light & Power Co. to advertise the comic Westinghouse refrigeration show at the Elks Hall here. The show was staged by professionals from Boston, under the sponsorship of the utility. It was attended by 130 citizens.

## KRAMER COMMERCIAL EVAPORATORS

are all copper hot tinned construction, or copper fin steel tube for ammonia systems. Also all steel hot galvanized for ammonia. Made in all fin sizes—various fin spacings—to any over all dimensions, and to required capacities.

DOMESTIC EVAPORATORS — UNIT COOLERS — AIR & WATER COOLED CONDENSERS

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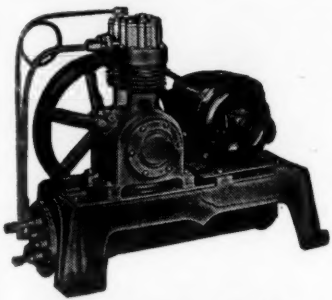


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# BUYER'S GUIDE

MANUFACTURERS SPECIALIZING IN SERVICE  
TO THE REFRIGERATION INDUSTRY



Style EW—Water Cooled  
With Water Cooled Head

## STARR FREEZE OUTSTANDING PERFORMANCE attested by satisfied users — EVERYWHERE!

Sturdy Condensing Units from 80 to 2868 Lbs. I.M.E., and all other commercial refrigeration equipment—Wall type cases with machinery—A beautiful household line of modern, conservative styles—Write for full data.

### THE STARR COMPANY

Cable "Starr" Richmond, Indiana (factory) Since 1927  
1344 S. Flower St., Los Angeles, Calif.

## WATER REGULATOR TYPE WRP

FOR  
METHYL  
SULPHUR  
FREON

NOISELESS—TIGHT CLOSING  
Head Pressure Range 50-185 lb. Ga. Std.  
Water Pressure Std. to 150 lb. Ga.  
Operating Differential 15 lbs. Ga.  
Sizes  $\frac{3}{8}$ "- $\frac{1}{2}$ "- $\frac{3}{4}$ " std. female pipe threads



WRP

THE ELECTRICIMATIC CORPORATION  
2100 INDIANA AVE., CHICAGO, ILL.

## QUESTIONS

### Recipe Books

No. 2271 (Distributor, Pennsylvania)—"Could you assist us in obtaining a source of supply for a recipe book to be used in promoting the sale of electric refrigerators?"

Answer: Several recipe books containing frozen dessert recipes for use in connection with household electric refrigerators have been issued by Borden Kitchen Institute, 350 Madison Ave., New York City.

A number of the larger manufacturers of household electric refrigerators put out recipe books which are generally accepted as standard.

### Ice Cream Cabinet Lids

No. 2272 (Dealer, Kansas)—"We are seeking the whereabouts of the manufacturer who can supply our occasional need for 10-inch lids, for mechanical refrigerated ice cream cabinets having non-corrosive sheet metal tops. The 'standard' lid used by the mass-production manufacturers of ice cream cabinets (Frigidaire, Kelvinator, etc.) consists of three separate units—a flexible, non-conducting, breaking ring about 2 in. wide; an angle-section of non-corrosive metal ring to lend finish to the insert opening; and the 'lid' proper, which is a composite of insulating materials and non-corrosive metal about 2 inches thick, with a hand-knob superimposed on the center of the top side. We hope that this somewhat random description will suffice to inform you of what it is we are searching for."

Answer: Manufacturers of lids for ice cream cabinets are listed on pages 202 and 203 of the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY.

### Grunow Weights

No. 2273 (Distributor, Pennsylvania)—"Would you be good enough to kindly send us the copy of REFRIGERATION NEWS which published the net weights of Grunow refrigerators?"

Answer: The shipping weights of 1935 Grunow refrigerators were published in the March 20 specifications issue of ELECTRIC REFRIGERATION NEWS.

### Air-Conditioning List

No. 2274 (Manufacturer, New York)—"I am interested in receiving a list of manufacturers of air-conditioning equipment. If you have such a list please send it to me at your earliest convenience."

Answer: Manufacturers of all types of air-conditioning systems and equipment are listed beginning on page 150 of the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY.

### McKinney Co. Address

No. 2275 (Dealer, Pennsylvania)—"Please wire by Western Union name and address of McKinney Co., listed as suppliers of Grunow hardware."

Answer: McKinney Mfg. Co., Liverpool and Metropolitan Aves., Pittsburgh, Pa.

### 1934 Production Figures

No. 2276 (Publisher, District of Columbia)—"If available, please wire collect 1934 total electric refrigerator production and installations of air-conditioning units comparable to total of page 465 of 1934 DIRECTORY."

Answer: Manufacturers shipped 1,390,000 household electric refrigerators to sales outlets in 1934. Air conditioning installations in 30 cities to date number 3,710.

### List of Southern Firms

No. 2277 (Supplier, Texas)—"We are interested in securing trade mailing list of all refrigeration distributors, dealers, and service men in the State of Texas and western part of Louisiana. As a subscriber of your publication we would appreciate your advising us where we can secure such a list. We are wholesalers of refrigeration supplies and carry a stock, and are preparing a catalog to mail out to the trade."

Answer: A list of independent service men is published in the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY, beginning on page 361.

We regret that we cannot furnish you with a list of distributors and dealers.

### Monthly Sales Data

No. 2278 (Insurance Firm, Illinois)—"I am desirous of obtaining latest statistical data on sales of electrical refrigeration, particularly domestic refrigeration."

"I am anxious to learn the monthly retail sales history; the monthly wholesale sales history, and the monthly factory production history."

Answer: All available statistical information covering the refrigeration and air-conditioning industries will be

included in the 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK which will be available in about two weeks.

This volume will contain sales of household electric refrigerators to distributors and dealers by manufacturers in each month of the years 1930 through 1934 and will also show monthly factory productions of all types of equipment during 1934.

### Ice Consumption Data

No. 2279 (Advertising Agency, Ohio)—"We are anxious to get figures, immediately, on ice consumption in the United States. Can you help us out? Here is the information wanted:

"1. National average consumption of ice per family (pounds used per year)."

"2. National average cost of ice."

Answer: According to the latest department of Commerce census for 1933, 32,538,698 tons of ice were produced during that year with a value of \$139,412,849 at platform prices. Value of manufactured ice in 1931 amounted to \$192,027,308, and in 1929 to \$210,952,264.

You may be able to obtain more complete information by writing to Leslie C. Smith, secretary of the National Association of Ice Industries, 228 North LaSalle St., Chicago, Ill.

### Air-Conditioning Data

No. 2280 (Sales Representative, California)—"I want to get all the information possible on air-conditioning installations, equipment and names of manufacturers."

"As I recall you publish a book or directory of manufacturers. If there is such a publication that is up to date, what does it cost?"

"I will also appreciate any list of books on the subject which may be available."

"The market for this equipment is in the western states and I intend to make connections with a manufacturer or manufacturers, who do not have satisfactory representation in this territory at the present time. I will probably locate in Southern California, all depending on the connection I make."

"All information which you can give me will be very much valued."

Answer: The 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY lists all manufacturers of refrigeration and air-conditioning equipment, parts, materials, supplies, and accessories. Price of this volume is \$3.

The 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK, which will be available in a few days, will contain complete refrigeration and air-conditioning statistical data, including a record of air-conditioning installations and connected horsepower for 30 large American cities.

Combination rate for the two volumes is \$5, or when ordered in connection with a subscription to ELECTRIC REFRIGERATION NEWS, is \$6.50. ELECTRIC REFRIGERATION NEWS reports news and developments in both refrigeration and air-conditioning fields, and special issues of the News feature air conditioning. Specifications of 1935 air-conditioning equipment were published in the March 27, 1935 and May 22, 1935 issues.

### Taylor Sales Co. Address

No. 2281 (Service Company, South Carolina)—"I am one of your subscribers and I wish you would do me a favor at once. I am sending in this letter a self-addressed envelope. I want you to send me the address of the Tyler Sales and Display Case Co., whose plant is located somewhere in your state. I may have the name a little incorrect but if you know of such a concern please let me hear from you at once as this is very important."

Answer: Address Tyler Sales Fixture Co. at Niles, Mich. This company also has branches in New York City and Cincinnati, Ohio.

### Refrigerant Drums

No. 2282 (Refrigeration Supply Company, Minnesota)—"Will you send us the names of the manufacturers of small refrigerant service drums and the manufacturers of low sides for domestic boxes?"

Answer: Manufacturers of refrigerant drums are listed on page 331 of the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY. Manufacturers of household evaporators are listed on page 252 of the same volume.

### Insulation Used

No. 2283 (Dealer, Pennsylvania)—"I would like to know where I can secure data on the percentage of insulation used on the different makes of electric refrigerators."

Answer: We assume that you have in mind the thickness of insulation used on various makes of household electric refrigerators. This information is given in the specifications of household refrigerators published in the March 20, 1935, issue of ELECTRIC REFRIGERATION NEWS.

The original supply of copies of this issue has been exhausted, but complete revised specifications will be published in the June 12 issue.

## CLASSIFIED

RATES: Fifty words or less, one insertion \$2.00, additional words four cents each. Three insertions \$5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.

### EQUIPMENT FOR SALE

ATTENTION: Dealers and Service Men. Rebuilt Mayson expansion valves, \$1.00. Rebuilt American Radiator expansion valves, \$1.65. Ranco controls, all types, \$1.75. Frigidaire and Kelvinator dry and flooded coils \$2.50 up. Bargains in Mullins Evaporators. Rebuilt domestic and commercial units \$12.50 up; all sizes from  $\frac{1}{4}$ th HP to  $1\frac{1}{2}$  HP; thoroughly rebuilt, fully reconditioned. Evaporators all sizes and types \$2.50 up. Federal Refrigerator Corp., 437 11th Ave., New York, N. Y.

DEALERS ATTENTION! We have 1500 new, used and reconditioned electric and gas refrigerators of nationally known makes, at real low prices for resale. Guaranteed. Territory protection. Also slightly used twin Frigidaire, Kelvinator, Universal, Norge,  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1 and  $1\frac{1}{2}$  H. P. water and air cooled commercial compressors. Two tray Kelvinator, Frigidaire, Zerozone coils \$1.75 each. Write for information. Macklam Refrigerator Sales Corp., 220 West Huron St., Chicago.

### FRANCHISE AVAILABLE

DISTRIBUTORS to represent one of the largest wholesalers in the reconditioned and brand new refrigerator business. Large selections of nationally known boxes always in stock; all sizes. All fully guaranteed. Franchise rights granted responsible dealers. We also want Resident Buyers for our merchandise; on exclusive territory basis. Send for catalogue showing specifications and prices for domestic and export trade. When buying reconditioned refrigerators, look for the label "Manufactured by Federal Refrigerator Corp., 437 11th Ave., New York."

### BUSINESS FOR SALE

BUSINESS For Sale, an unusual opportunity, established five years, servicing, installing, buying and selling new and used equipment, mostly commercial, also conducting service school which offers wonderful possibilities. Four story modern building, heart of city, low rental. B. L. Williams, 1232 14th St. N. W., Washington, D. C.

### ACCESSORIES DISTRIBUTORS WANTED

MANUFACTURER of popular line of refrigeration accessories wants stocking distributors in Salt Lake City, San Antonio, Portland, Seattle, Spokane, Tulsa, Shreveport, Chattanooga, Winnipeg, Denver, Syracuse, Richmond and Norfolk (Va.), Birmingham, Louisville, Savannah, Jacksonville, Tampa and Miami. Advise lines at present handled, sales activities, financial references, and how territory is covered. Box 708, Electric Refrigeration News.

### SERVICE

ATTENTION: Refrigeration Service Men. Service sheets available for opening and servicing the Majestic hermetically sealed refrigerator unit. Price, \$2.00. Interstate Machine Works, 111 S. 11th St., Boise, Idaho.

### REPAIRS

HALELECTRIC thermostat repair service. B & B, G.E., Cutler-Hammer, Penn. Ranco, Tag, etc. Expansion valves repaired. Gas service, Ethyl, Methyl, Iso-Butane, Sulphur. Your cylinder or ours. Competitive prices. Halcetric Laboratory, 1793 Lakeview Road, Cleveland, Ohio.

GENERAL ELECTRIC Monitor Tops repaired regardless of condition. Burn outs, gas leaks, stuck ups, high wattage—anything and everything. All work guaranteed. Quick service. Ship units freight prepaid. Average repair charge \$10.00. Hermetic Refrigerator Repair Service, 200 West 34th St., New York, N. Y.

### PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. Van Deventer (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

## If You Need a Trained Refrigeration Man—

call on this FREE Placement Bureau.

Among the graduates of this school we have trained and competent shop mechanics, and efficient installation and service men available in almost every locality. Many already have practical working experience.

Save time, trouble and money by patronizing this service when adding to your force or making a replacement. No charge to you or to prospective employee. Write, phone or wire for quick, courteous, efficient service.

Placement Division

Utilities Engineering Institute

404 N. Wells St. 1841 Broadway  
Chicago, Illinois New York, N. Y.

## CURTIS REFRIGERATION

Commercial & domestic units, 1/6 h.p.—15 h.p.

Distributor franchises available. Write to:

CURTIS REFRIGERATING MACHINE CO.,

Division of Curtis Manufacturing Company

1912 Kienlen Ave., St. Louis, Mo.

## LARKIN COILS

for AIR CONDITIONING

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The following special rates are for PAID-IN-ADVANCE subscriptions only in the United States and Possessions and Pan-American Postal Union Countries. Charge orders are billed at the single-subscription rate, regardless of number. Papers will be mailed to individual addresses.

	Electric Refrigeration News (weekly)	1935 Refrigeration Directory and Market Data Book (2 volumes)	Both Electric Refrigeration News and Refrigeration Directory
1 subscription	\$3.00	\$5.00	\$8.50
5 or more each	2.75	4.50	6.50
10 or more each	2.50	4.00	6.50
20 or more each	2.25	3.50	5.75
50 or more each	2.00	3.00	5.00
75 or more each	1.75	2.50	4.25
100 or more each	1.50	2.00	3.50

### For All Other Countries (Except Canada)

1 subscription	\$5.00	\$6.00	\$9.00
5 or more each	4.75	5.50	8.50
10 or more each	4.50	5.00	8.00
20 or more each	4.25	4.50	7.50
50 or more each	4.00	4.00	7.00

### Canadian Rates (including tariff of 5 cents per copy on the News)

1 subscription	\$6.00	\$6.00*	\$11.00*
5 or more each	5.75	5.50*	10.50*
10 or more each	5.50	5.00*	10.00*
20 or more each	5.25	4.50*	9.50*
50 or more each	5.00	4.00*	9.00*

\*Canadian subscribers are required to pay a tariff and excise tax on the Directory and Market Data Book which amounts to \$2.50. These extra charges on books will be collected by the Canadian postoffice at the time of delivery.

## Subscription Order

Business News Publishing Co.  
5229 Cass Ave., Detroit, Mich. Date.....

☐ Enter my subscription to Electric Refrigeration News for one year (52 issues).  
☐ Send the 1935 Refrigeration Directory and Market Data Book (2 volumes).  
☐ Enclosed find remittance. (See rates above.)

Name .....

Attention of .....

Street Address ..... City and State .....

We sell the ..... refrigerator and .....  
(Please indicate other products or principal line of business.)